Canovision 8

SERVICE MANUAL

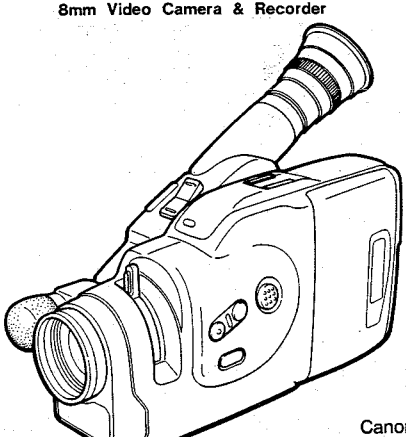
E50E, F

(REF. NO. D15-3230, 3270)

8mm Video Camera & Recorder

PAL

SECAM



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CANON INC. 1990

Canon Inc.
Video Technical Service Dept.
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SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine CANON replacement parts.
   Especially critcal parts in the power circuit block should not be replaced with other makes.
   Critical parts are marked with ⚠ in the schematic diagrams.
2. The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in the viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, CANON approved one.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been oberheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

5-1 Leakage Current Cold Check

1) Unplug the AC cord and connect a jumper between the two prongs on the plug.
2) Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metalic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metalic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ. When the exposed metal does not have a return path to the chassis, the reading must be ∞.

5-2 Leakage Current Hot Check

1) Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2) Connect a 1.5KΩ 10 watt resistor, paralleled by 0.15μF capacitor, between each exposed metalic parts on the unit and a good earth ground such as a water pipe, as shown in figure 1.
3) Use an AC voltmeter, with 1000Ω volt or more sensitivity, to measure the potential across the resistor.
4) Check all exposed metallic parts of the cover (Cable connection, Handle bracket, metallic cabinet. Screwheads, Metallic overlays, etc), and measure the voltage at each point.
5) Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6) The potential at any point should not exceed 0.75V RMS.
   A leakage current tester (FLUKE MODEL: 8000A equivalent) may be used to make the hot checks.
   Leakage current must not exceed 0.5 milliamp.
   In case a measurement is out side of the limits specified, there is a possibility of a shock hazard, and corrective action must be taken before returning the instrument to the customer.

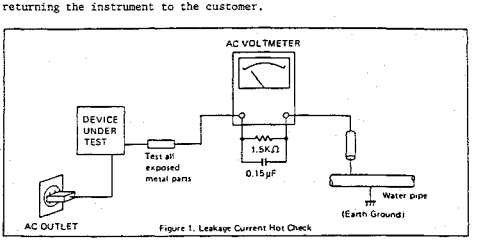

Figure 1. Leakage Current Hot Check

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1. ESPECIALLY CRITICAL PARTS IN THE POWER CIRCUIT BLOCK SHOULD NOT BE REPLACED WITH OTHER MARKS.
   CRITICAL PARTS ARE MARKED WITH ⚠ IN THIS ELECTRICAL PARTS LIST.

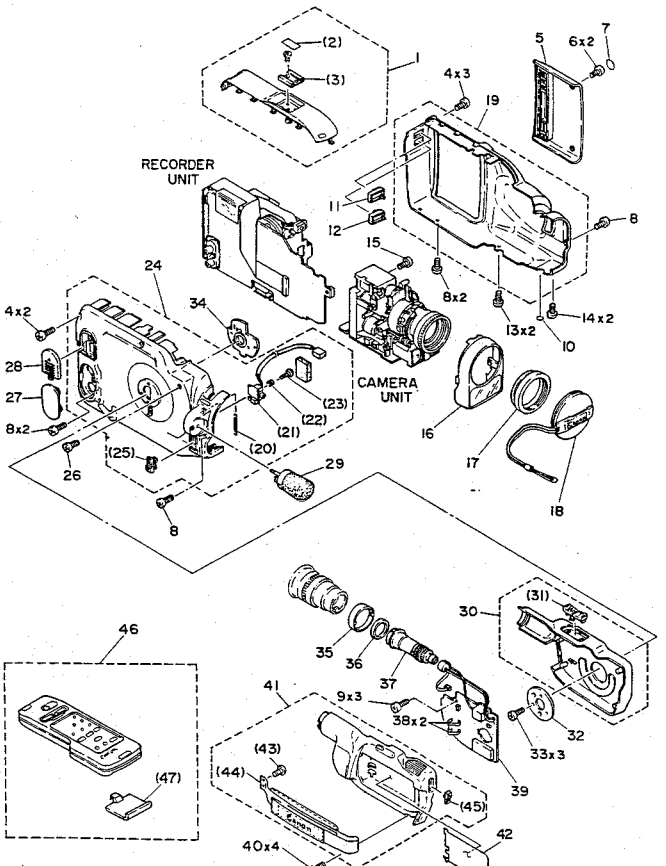
2. THE NUMBERS INDICATED ON THE CONNECTORS DO NOT CORRESPOND TO THE SYMBOL NUMBERS.
   PLEASE CHECK THE CORRECT SYMBOL NUMBERS OF THE CONNECTORS ON THE INTERCONNECTION SCHEMATIC DIAGRAM.

PREFACE

- The E50E, F is basically the same as the E30E, F except an 8X zoom lens and the new, slimmer SF-200 Sports Finder (Standardly equipped) aiming a broader shooting range and enhanced operability.
- The reader using this manual is expected to use circuit diagrams, pattern figures, disassembling / adjustment procedures of E30E, F.
  The following table shows the important points to be payed attention when servicing.

External appearance	• Material of Grip Cover Screw hole E30E, F → E50E, F Metal → Plastics (E50E : Changed during production.) (E50F : From initial production.) * The new service parts only are stocked. However, the screws are established respectively for two types. (specified an Parts Catalog) Use the right screw according to the type of material.
Recorder Section	• CN104 Installing Position Owing to the adoption of 8X zoom lens, the installing position of CN104 (installed at the Connecting part with the process C.B.A.) is slightly shifted. * The Recorder Main C.B.A.s for the E30E, F and the E50E, F are not interchangeable.
Camera Section	• Form of Process C.B.A. Owing to the adoption of 8x zoom lens, the form of Process C.B.A. is partially modified. • Components of Lens Assembly The components of lens assembly are partially changed. For disassembling / reassembling, refer to the exploded figures on Parts Catalog or the disassembling / adjustment procedures of lens section on the Service Manual for the E30E, F. • Replacement of AF C.B.A. when replacing the AF C.B.A., reverse the polarity of PZ motor.

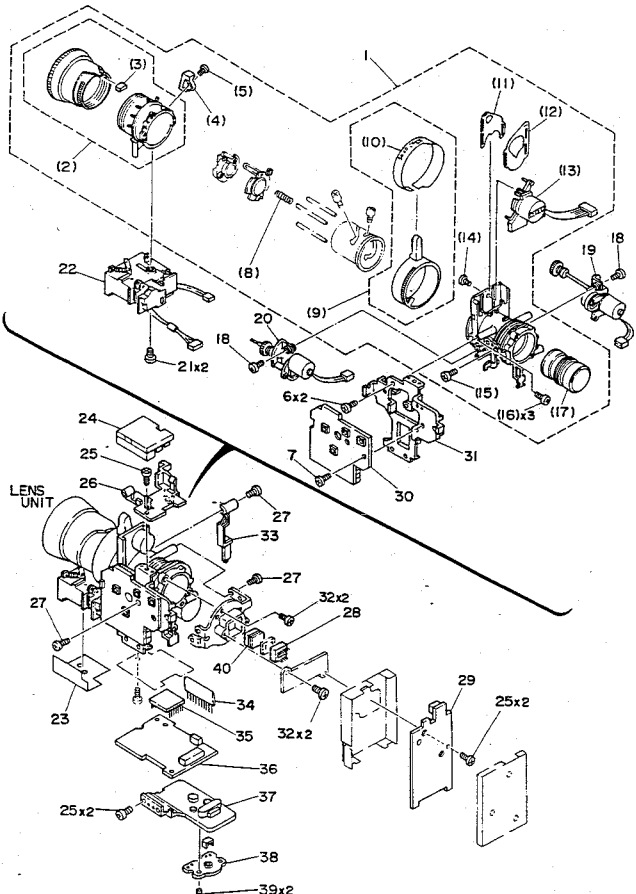
Casing Parts Section



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DG9-0182-000 000	B	1	TOP COVER ASS'Y	VCC810 ONLY
2	DA1-2489-000 000	B	1	SHEET, ACCESORY SHOE	
3	DA1-2486-000 000	B	1	SHOE, ACCESORY	
4	XA4-7200-459 000	F	5	SCREW, CROSS-RECESS, PH	
5	DF1-0867-000 000	B	1	COVER, CASSETTE	VCC810 ONLY
6	XA1-7200-359 000	F	2	SCREW, CROSS-RECESS, PH	
7	DA1-2514-000 000	B	2	SEAL	
8	XA1-6200-509 000	F	6	SCREW, CROSS-RECESS, PH	
9	XA4-9200-409 000	F	3	SCREW, CROSS-RECESS, PH	
10	DA1-2898-000 000	C	1	SEAL, PC	
11	DA1-2793-000 000	B	1	KNOB, EJECT	
12	DA1-4081-000 000	B	1	KNOB, POWER	
13	XA1-7200-409 000	F	2	SCREW, CROSS-RECESS, PH	
14	XA1-6200-759 000	F	2	SCREW, CROSS-RECESS, PH	
15	XA1-7200-407 000	F	1	SCREW, CROSS-RECESS, PH	
16	DG9-0181-000 000	B	1	LENS COVER ASS'Y	VCC810 ONLY
	DG9-0177-000 000	B	1	LENS COVER ASS'Y	E50F ONLY
17	DA1-1702-000 000	B	1	HOOD	
18	DF1-0865-000 000	B	1	CAP, LENS	VCC810 ONLY
19	DY1-5004-000 000	B	1	RIGHT COVER ASS'Y	VCC810 ONLY
	DY2-1217-000 000	B	1	RIGHT COVER ASS'Y	E50F ONLY
20	DS1-5185-000 000	C	1	SPRING, COIL	
21	DG1-0895-000 000	C	1	MIC JACK C.B.A.	
22	DA1-1811-000 000	C	1	CUSHION, RUBBER	
23	DA1-1815-000 000	F	1	SCREW, CROSS-RECESS	
24	DY2-1221-000 000	B	1	LEFT COVER ASS'Y	
25	DA1-2598-000 000	B	1	KNOB, GRIP	
26	XA4-7200-609 000	F	1	SCREW, CROSS-RECESS, PH	
27	DA1-4080-000 000	B	1	CAP, AV	
28	DA1-4068-000 000	B	1	COVER, BATTERY	
29	DH9-0510-000 000	C	1	MICROPHONE ASS'Y	VCC810 ONLY
30	DY2-1219-000 000	B	1	RIGHT COVER, GRIP	
31	DA1-2460-000 000	B	1	KNOB, T/W	
32	DA1-2461-000 000	C	1	PLATE	
33	XA9-0503-000 000	F	3	SCREW, CROSS-RECESS, PH	
34	DA1-2600-000 000	C	1	PLATE	
35	DA1-2457-000 000	B	1	RING, E.V.F.	
36	DA1-1864-000 000	B	1	RING, RUBBER	
37	DY2-1159-000 000	C	1	CRT ASS'Y	
38	DA1-2463-000 000	C	2	TERMINAL, BATTERY	
39	DG1-0930-000 000	C	1	GRIP C.B.A.	
40	XA4-9260-709 000	F	4	SCREW, CROSS-RECESS, PH	
41	DG1-1362-000 000	B	1	LEFT COVER, GRIP	VCC810 ONLY
42	DA1-2518-000 000	B	1	SEAL	
43	XA9-0435-000 000	F	2	SCREW, CROSS-RECESS, PH	
44	DA1-4132-000 000	B	1	STRAP, HAND	VCC810 ONLY
45	DA1-2517-000 000	B	1	KNOB, BATTERY	
46	DY1-5005-000 000	B	1	WIRELESS CONTROLLER VWR880	VCC810 ONLY
	DY2-1202-000 000	B	1	WIRELESS CONTROLLER WL-400F	E50F ONLY
47	DY3-4197-000 000	B	1	COVER BATTERY	

Lens / Camera Unit Section

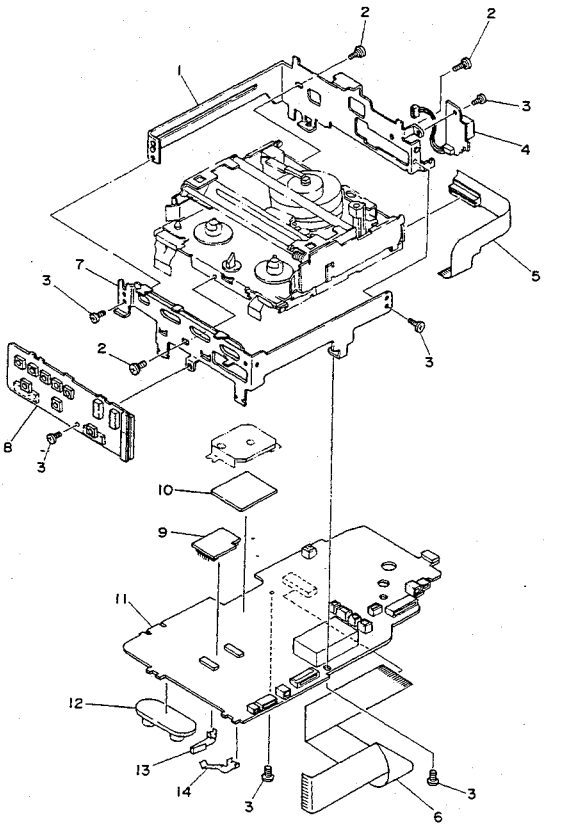


MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY1-7121-000 000	C	1	ZOOM LENS ASS'Y	
2	DY1-7122-000 000	C	1	FOCUS LENS ASS'Y	
3	DA7-1734-000 000	C	1	STOPPER, RUBBER	
4	DA7-1724-000 000	C	1	STOPPER, NEARDISTANCE	
5	XA4-4200-507 000	F	1	SCREW, CROSS-RECESS, PH	
6	XA4-3200-507 000	F	2	SCREW, CROSS-RECESS, PH	
7	XA1-6200-407 000	F	1	SCREW, CROSS-RECESS, PH	
8	DS1-5198-000 000	C	1	SPRING, COIL	
9	DY1-7118-000 000	B	1	ZOOM RING ASS'Y	
10	DA7-2003-000 000	B	1	SHEET, ZOOM	
11	DA7-1792-000 000	C	1	BLIND, IG METER (B)	
12	DF7-0231-000 000	C	1	BLIND, IG METER (A)	
13	DH8-0045-000 000	C	1	IG METER	
14	XA4-4170-407 000	F	1	SCREW, CROSS-RECESS, PH	
15	XB4-6260-607 000	F	1	SCREW M2.6x6	
16	XA4-9170-557 000	F	3	SCREW, CROSS-RECESS, PH	
17	DG9-3384-000 000	C	1	RELAY LENS ASS'Y	
18	X96-1723-610-000	F	2	SCREW, SLOTTED, SHOULDER	
19	DG9-3449-000 000	C	1	AF MOTOR ASS'Y	
20	DG9-3450-000 000	C	1	PZ MOTOR ASS'Y	
21	XA4-2170-707 000	F	2	SCREW, CROSS-RECESS, PH	
22	DY1-7119-000 000	C	1	AF BLOCK ASS'Y	
23	DA1-2138-000 000	C	1	SHEET	
24	DH3-0015-000 000	C	1	DC/DC CONVERTER	
25	XA1-7200-307 000	F	5	SCREW, CROSS-RECESS, PH	
26	DA1-4085-000 000	C	1	HOLDER, DC/DC	
27	XA4-9200-609 000	F	3	SCREW, CROSS-RECESS, PH	
28	DH4-0248-000 000	B	1	CCD MN3745NC	
29	DG1-0843-000 000	C	1	SENSOR C.B.A.	
30	YG9-5010-000 000	C	1	AF C.B.A.	*4
31	YA1-0031-000 000	C	1	HOLDER, CAMERA (A)	
32	XA4-9200-509 000	F	4	SCREW, CROSS-RECESS, PH	
33	DA1-4077-000 000	C	1	HOLDER, PCB	
34	DH4-0247-000 000	C	1	AWB C.B.A.	
35	DH4-0250-000 000	C	1	ENCORDER C.B.A.	
36	DG1-0844-010 000	C	1	PROCESS C.B.A.	
37	DA1-2770-000 000	C	1	HOLDER, CAMERA (B)	
38	DA1-2773-000 000	C	1	PLATE, TRIPOD	
39	XA4-8260-509 000	F	2	SCREW, CROSS-RECESS, PH	
40	DH9-0483-000 000	C	1	CRYSTAL, FILTER ASS'Y	

*4 See the table on page ↑.

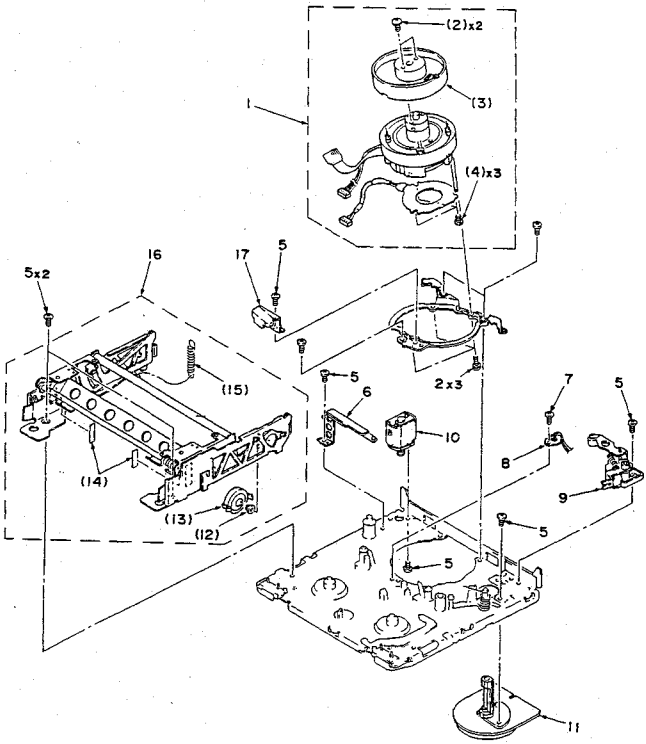
Recorder Unit Section



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DA1-2777-0[illegible] 000	C	1	HOLDER (A), RECORDER	
2	DA1-1948-0[illegible] 000	F	3	SCREW, CROSS-RECESS	
3	XA1-7200-307-000	F	6	SCREW, CROSS-RECESS, PH	
4	DG1-0894-000 000	C	1	REMOCON C.B.A.	
5	DF1-0562-000 000	C	1	PRINTED CORD	
6	DH2-1098-000 000	C	1	PRINTED CORD	
7	DA1-2778-000 000	C	1	HOLDER (B), RECORDER	
8	DG1-0898-000 000	C	1	RECORDER KEY C.B.A.	
9	DG1-0828-000 000	C	1	JOG C.B.A.	
10	DH4-0243-000 000	C	1	HEAD AMP C.B.A.	
11	DG1-1331-000 000	C	1	RECORDER MAIN C.B.A.	E50E ONLY
	DY2-1218-000 000	C	1	RECORDER MAIN C.B.A.	E50F ONLY
12	DH9-0341-000 000	C	1	PIN JACK ASS'Y	
13	DA1-2796-000 000	C	1	TERMINAL, BATTERY	
14	DA1-2795-000 000	C	1	TERMINAL, BATTERY	

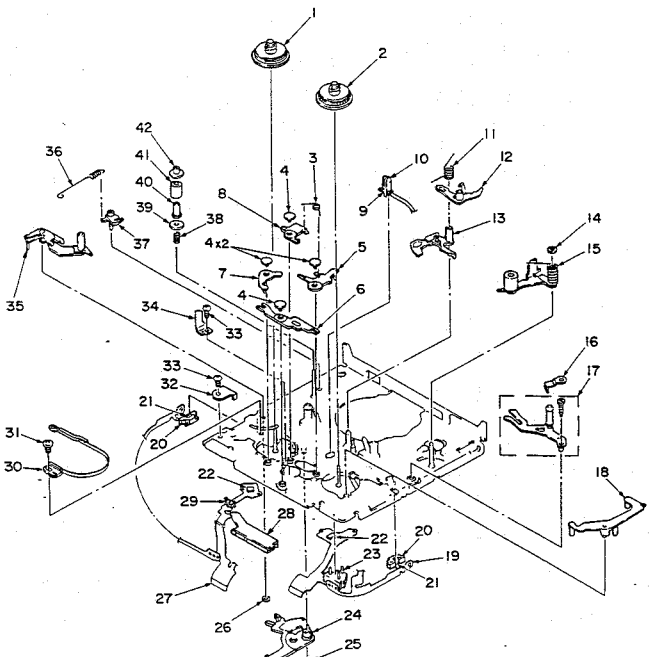
Mechanical Chassis Section I



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-2732-000 000	E	1	DRUM ASS'Y	
2	DY4-2730-000 000	F	5	SCREW, CROSS-RECESS	
3	DY4-2733-000 000	E	1	UPPER DRUM ASS'Y	
4	DY4-2452-000 000	F	3	SCREW	
5	DY4-2727-000 000	F	10	SCREW, CROSS-RECESS	
6	DY4-2675-000 000	C	1	TERMINAL, EARTH	
7	DY4-2728-000 000	F	1	SCREW, CROSS-RECESS	
8	Y22-8120-080 000	B	1	SENSOR, DEW	
9	DY4-2652-000 000	C	1	ROLLER ASS'Y	
10	DY4-2651-000 000	C	1	LOADING MOTOR ASS'Y	
11	DY4-2726-000 000	C	1	CAPSTAN MOTOR	
12	DY4-2720-000 000	C	1	DAMPER, OIL	
13	DY4-2709-000 000	C	1	GEAR, DAMPER	
14	DY4-2729-000 000	C	2	TAPE	
15	DY4-2708-000 000	C	1	SPRING, COIL	
16	DY4-2673-000 000	C	1	CASSETTE COMPARTMENT ASS'Y	
17	DY4-2721-000 000	C	1	GUARD, GUIDE	

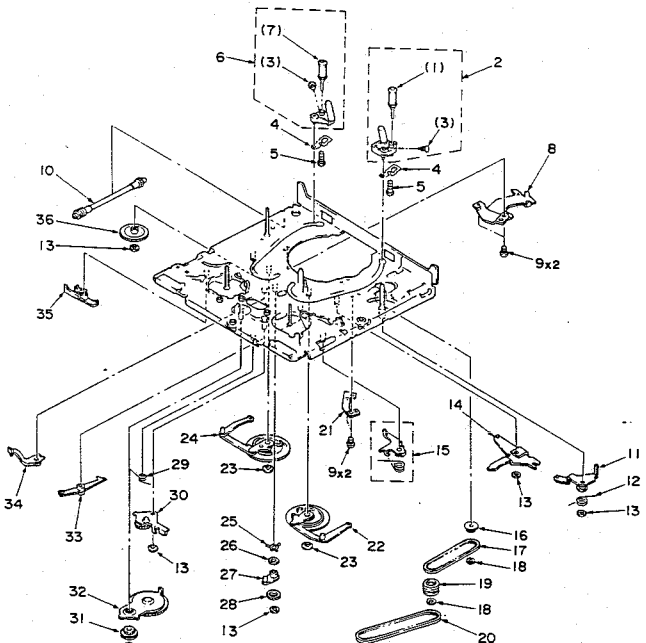
Mechanical Chassis Section 2



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-2663-000 000	C	1	REEL, SUPPLY	
2	DY4-2666-000 000	C	1	REEL, TAKE UP	
3	DY4-2699-000 000	C	1	SPRING, COIL	
4	DY4-2696-000 000	C	4	PIN, SHAFT	
5	DY4-2714-000 000	C	1	BRAKE, T	
6	DY4-2692-000 000	C	1	LEVER, LB	
7	DY4-2691-000 000	C	1	BRAKE, LB	
8	DY4-2713-000 000	C	1	BRAKE, S	
9	DY4-2710-000 000	C	1	HOLDER, LED	
10	Y22-8012-000 000	B	1	LED GL452S	
11	DY4-2697-000 000	C	1	SPRING, COIL	
12	DY4-2716-000 000	C	1	ARM, STOPPER	
13	DY4-2723-000 000	C	1	STOPPER, RK	
14	DY4-2440-000 000	F	1	WASHER	
15	DY4-2653-000 000	C	1	ARM, PINCH	
16	DY4-2707-000 000	C	1	SPRING, PLATE	
17	DY4-2664-000 000	C	1	ARM, TG7	
18	DY4-2712-000 000	C	1	ARM RELEASE	
19	DY4-2680-000 000	C	1	FLEXIBLE C.B.A. (2)	
20	DY4-2722-000 000	C	2	HOLDER, SENSOR	
21	Y22-8123-000 000	B	2	PHOTO TRANSISTOR EE-P109	
22	Y22-8121-000 000	B	2	PHOTO IC SPI-315-25-BD	
23	DY4-2678-000 000	C	1	SWITCH, PUSH	
24	DY4-2657-000 000	C	1	LEVER, SWITCH	
25	DY4-2688-000 000	F	1	WASHER	
26	DY4-2681-000 000	F	1	WASHER	
27	DY4-2679-000 000	C	1	FLEXIBLE C.B.A. (1)	
28	DY4-2677-000 000	C	1	SWITCH, SLIDE	
29	DY4-2676-000 000	C	1	SWITCH	
30	DY4-2660-000 000	C	1	BAND, TENSION	
31	DY4-2727-000 000	F	1	SCREW, CROSS-RECESS	
32	DY4-2725-000 000	C	1	PLATE, SW[illegible]H	
33	DY4-2728-000 000	F	2	SCREW, C[illegible] RECESS	
34	DY4-2690-000 000	C	1	PLATE, T[illegible]	
35	DY4-2669-000 000	C	1	ARM	
36	DY4-2724-000 000	C	1	SPRING, COIL	
37	DY4-2717-000 000	C	1	ARM, ADJUST	
38	DY4-2705-000 000	C	1	SPRING, COIL	
39	DY4-2701-000 000	C	1	FLANGE, TG2	
40	DY4-2704-000 000	C	1	SLEEVE, TG2	
41	DY4-2702-000 000	C	1	ROLLER, TG2	
42	DY4-2703-000 000	C	1	FLANGE, TG2	

Mechanical Chassis Section 3



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-2674-000 000	C	1	ROLLER, GUIDE	
2	DY4-2649-000 000	C	1	COASTER, RIGHT	
3	DY4-2686-000 000	F	2	SCREW, CROSS-RECESS	
4	DY4-2685-000 000	C	2	SPRING, LEAF	
5	DY4-2689-000 000	F	2	SCREW, CROSS-RECESS	
6	DY4-2648-000 000	C	1	COASTER, LEFT	
7	DY4-2662-000 000	C	1	ROLLER, GUIDE	
8	DY4-2672-000 000	C	1	PLATE, SS	
9	DY4-2728-000 000	F	4	SCREW, CROSS-RECESS	
10	DY4-2658-000 000	C	1	WORM ASS'Y	
11	DY4-2665-000 000	C	1	ARM; PINCH SUB	
12	DY4-2706-000 000	C	1	SPRING, COIL	
13	DY4-2688-000 000	F	5	WASHER	
14	DY4-2655-000 000	C	1	LEVER, THREADING	
15	DY4-2659-000 000	C	1	BRAKE, TS	
16	DY4-2656-000 000	C	1	GEAR, JOINT	
17	DY4-2719-000 000	E	1	BELT (S), TIMING	
18	DY4-2681-000 000	F	3	WASHER	
19	DY4-2671-000 000	C	1	PULLY, RELAY	
20	DY4-2718-000 000	E	1	BELT (L), TIMING	
21	DY4-2684-000 000	C	1	PLATE, TT	
22	DY4-2668-000 000	C	1	GEAR	
23	DY4-2440-000 000	F	2	WASHER	
24	DY4-2667-000 000	C	1	GEAR	
25	DY4-2700-000 000	C	1	SPRING	
26	DY4-2527-000 000	F	1	WASHER	
27	DY4-2695-000 000	C	1	ARM, UL	
28	DY4-2694-000 000	C	1	GEAR, UL	
29	DY4-2698-000 000	C	1	SPRING, COIL	
30	DY4-2650-000 000	C	1	GEAR, ASS'Y	
31	DY4-2661-000 000	C	1	GEAR	
32	DY4-2654-000 000	C	1	GEAR, ASS'Y	
33	DY4-2693-000 000	C	1	ARM, RELEASE	
34	DY4-2715-000 000	C	1	BRAKE, UL	
35	DY4-2711-000 000	C	1	LEVER, EJECT	
36	DY4-2687-000 000	C	1	GEAR, WHEEL	

ELECTRICAL PARTS

	SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
⚠	C2912	VC5-9850-332 003	C	1	CAPACITOR, FILM 3300pF 100V	
⚠	C2915	VC5-9520-102 000	C	1	CAPACITOR, CERA. 1000pF 1KV	
⚠	C2917	VC6-1570-152 000	C	1	CAPACITOR, CERA. 1500pF 500V	
	CN001	VS1-0875-011 000	C	1	CONNECTOR 11P	
	CN002	VS1-0875-013 000	C	1	CONNECTOR 13P	
	CN003	VS1-1169-025 000	C	1	CONNECTOR 25P	
	CN401	VS1-0875-015 000	C	1	CONNECTOR 15P	
	CN601	VS1-0875-025 000	C	1	CONNECTOR 25P	
	D101	WA1-0386-000 000	B	1	DIODE MA157	
	D102	WA1-0962-000 000	B	1	DIODE MA121	
	D105	WA1-1084-000 000	B	1	DIODE MA110	
	D109	WA1-0547-000 201	B	1	DIODE 1SS184	
	D110	WA1-0604-000 000	B	1	DIODE MA159	
	D401	WA1-0612-000 201	B	1	DIODE E10QS03	
	D402	WA1-0612-000 201	B	1	DIODE E10QS03	
	D403	WA1-1084-000 000	B	1	DIODE MA110	
	D404	WA1-1084-000 000	B	1	DIODE MA110	
	D405	WA1-1084-000 000	B	1	DIODE MA110	
	D601	WA1-1084-000 000	B	1	DIODE MA110	
	D602	WA1-1084-000 000	B	1	DIODE MA110	
	D603	WA1-1146-000 000	B	1	DIODE MA707	
	D604	WA1-0547-000 201	B	1	DIODE 1SS184	
	D605	WA1-0696-000 201	B	1	DIODE MA152WA	
	D606	WA1-1084-000 000	B	1	DIODE MA110	
	D607	WA1-1084-000 000	B	1	DIODE MA110	
	D608	WA1-1084-000 000	B	1	DIODE MA110	
	D609	WA1-1146-000 000	B	1	DIODE MA707	
	D610	WA1-1146-000 000	B	1	DIODE MA707	
	D611	WA1-1084-000 000	B	1	DIODE MA110	
	D614	WA1-1084-000 000	B	1	DIODE MA110	
	D2001	WA1-1084-000 000	B	1	DIODE MA110	
	D2002	WA1-1221-000 000	B	1	DIODE MA341S	
	D2051	WA1-0380-000 000	B	1	DIODE MA157	
	D2052	WA1-1084-000 000	B	1	DIODE MA110	
	D2053	WA1-0962-000 000	B	1	DIODE MA121	
	D2054	WA1-0962-000 000	B	1	DIODE MA121	
	D2055	WA1-1084-000 000	B	1	DIODE MA110	
	D2201	WA1-1084-000 000	B	1	DIODE MA110	
	D2202	WA1-1084-000 000	B	1	DIODE MA110	
	D2203	WA1-1084-000 000	B	1	DIODE MA110	
	D2204	WA1-1194-000 000	B	1	DIODE MA728	
	D2901	WA1-0989-000 000	B	1	DIODE MA3100W	
	D2902	WA1-1084-000 000	B	1	DIODE MA110	
	D2903	WA1-1084-000 000	B	1	DIODE MA110	
	D2904	WA1-1123-000 000	B	1	DIODE AG01Z	
	D2905	WA1-1124-000 000	B	1	DIODE SHV.02	
	D2951	WA1-1084-000 000	B	1	DIODE MA110	
	D2961	WA1-0384-000 000	B	1	ZENER DIODE RD5.6MB2	
	IC102	DH4-0205-000 000	B	1	IC LVC556	
	IC103	DH4-0190-000 000	B	1	IC CXA1237AR	
	IC104	WA4-0509-000 000	B	1	IC NJM2043M	
	IC106	DH4-0180-001 000	B	1	IC CXA1200BQ	
	IC107	DH4-0139-000 000	B	1	IC CXL1502M	
	IC108	DH4-0225-000 000	B	1	IC MM33-1002F	
	IC401	DH4-0189-000 000	B	1	IC CXA1127M	
	IC402	DH4-0029-000 000	B	1	IC CX20114	
	IC403	DH4-0030-000 000	B	1	IC CX20115	
	IC404	DH4-0135-000 000	B	1	IC CXA1204Q	
	IC601	DH4-0235-000 000	B	1	IC CXP80116	
	IC602	DH4-0240-000 000	B	1	IC μPD7508G-E97	

ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
IC603	WA4-1231-000 000	B	1	IC LB1631M	
IC604	DH4-0205-000 000	B	1	IC LVC556	
IC605	WA4-1167-000 000	B	1	IC RH5RA50AA	
IC606	WA4-1145-000 000	B	1	IC RH5VA45AA	
IC607	DH4-0236-000 000	B	1	IC MM1019	
IC2001	DH4-0124-000 000	B	1	IC MN53015CXZ	
IC2002	DH4-0125-000 000	B	1	IC MN53015CXY	
IC2051	WA3-3900-000 000	B	1	IC μPD6147G	
IC2102	WA4-0901-000 000	B	1	IC AN2011S	
IC2151	WA3-3679-000 000	B	1	IC MN3820S	
IC2201	WA4-0458-000 000	B	1	IC NJM3414M	
IC2202	WA4-0349-000 201	B	1	IC NJM2904M	
IC2203	DH4-0228-000 000	B	1	IC AN2154FAP	
IC2901	WA4-1322-000 000	B	1	IC AN2514S	
IC2931	DH4-0205-000 000	B	1	IC LVC556	
IC2941	DH4-0155-000 000	B	1	IC μPD6145G-101	
⚠ L2902	DH9-0459-000 000	D	1	COIL 184uH	
Q106	WA2-1436-000 000	B	1	TRANSISTOR 2SB962-Z	
Q107	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q108	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q109	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q110	WA2-0646-000 000	B	1	TRANSISTOR 2SD1328	
Q111	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q112	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q113	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q114	WA2-1230-000 000	B	1	TRANSISTOR IMH6	
Q115	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q116	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q117	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q118	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q119	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q120	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q121	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q124	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q125	WA2-1230-000 000	B	1	TRANSISTOR IMH6	
Q126	WA2-0884-000 000	B	1	TRANSISTOR DTC144EK	
Q127	WA2-1230-000 000	B	1	TRANSISTOR IMH6	
Q128	WA2-0884-000 000	B	1	TRANSISTOR DTC144EK	
Q129	WA2-0884-000 000	B	1	TRANSISTOR DTC144EK	
Q130	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q131	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q132	WA2-1298-000 000	B	1	TRANSISTOR DTC124TK	
Q133	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q134	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q135	WA2-1496-000 000	B	1	TRANSISTOR IMB8	
Q136	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q137	WA2-1230-000 000	B	1	TRANSISTOR IMH6	
Q138	WA2-0759-000 000	B	1	TRANSISTOR DTA144EK	
Q401	WA2-0797-000 201	B	1	TRANSISTOR 2SA1213	
Q402	WA2-0797-000 201	B	1	TRANSISTOR 2SA1213	
Q403	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q404	WA2-1198-000 000	B	1	TRANSISTOR IMD2	
Q405	WA2-1368-000 000	B	1	TRANSISTOR DTC114EK	
Q406	WA2-1368-000 000	B	1	TRANSISTOR DTC114EK	
Q407	WA2-0759-000 000	B	1	TRANSISTOR DTA144EK	
Q601	WA2-0759-000 000	B	1	TRANSISTOR DTA144EK	
Q602	WA2-0884-000 000	B	1	TRANSISTOR DTC144EK	
Q603	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q604	WA2-0759-000 000	B	1	TRANSISTOR DTA144EK	
Q605	WA2-1121-000 000	B	1	TRANSISTOR DTC143EK	

ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
Q606	WA2-0760-000 000	B	1	TRANSISTOR DTC114TK	
Q607	WA2-0884-000 000	B	1	TRANSISTOR DTC144EK	
Q608	WA2-0797-000 201	B	1	TRANSISTOR 2SA1213	
Q609	WA2-0884-000 000	B	1	TRANSISTOR DTC144EK	
Q2001	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q2002	WA2-1501-000 000	B	1	FET 2SK198	
Q2051	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2052	WA2-1172-000 000	B	1	TRANSISTOR 2SA1461	
Q2053	WA2-0052-000 000	B	1	TRANSISTOR 2SC1621	
Q2054	WA2-1172-000 000	B	1	TRANSISTOR 2SA1461	
Q2055	WA2-0052-000 000	B	1	TRANSISTOR 2SC1621	
Q2056	WA2-1172-000 000	B	1	TRANSISTOR 2SA1461	
Q2057	WA2-0052-000 000	B	1	TRANSISTOR 2SC1621	
Q2101	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q2102	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q2103	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q2151	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2201	WA2-1228-000 000	B	1	TRANSISTOR IMT2	
Q2202	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2203	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q2204	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q2205	WA2-1232-000 000	B	1	TRANSISTOR IMZ1	
Q2206	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q2207	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2208	WA2-1232-000 000	B	1	TRANSISTOR IMZ1	
Q2209	WA2-1232-000 000	B	1	TRANSISTOR IMZ1	
Q2210	WA2-1228-000 000	B	1	TRANSISTOR IMT2	
Q2211	WA2-1256-000 000	B	1	TRANSISTOR IMH5	
Q2212	WA2-1232-000 000	B	1	TRANSISTOR IMZ1	
Q2213	WA2-1232-000 000	B	1	TRANSISTOR IMZ1	
Q2214	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2401	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2402	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2403	WA2-1228-000 000	B	1	TRANSISTOR IMT2	
Q2404	WA2-0884-000 000	B	1	TRANSISTOR DTC144EK	
Q2405	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2410	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q2411	WA2-1232-000 000	B	1	TRANSISTOR IMZ1	
Q2412	WA2-1234-000 000	B	1	TRANSISTOR IMX2	
Q2901	WA2-0839-000 000	B	1	TRANSISTOR 2SA1Z26	
Q2902	WA2-1498-000 000	B	1	TRANSISTOR 2SA1162	
Q2903	WA2-0393-000 201	B	1	TRANSISTOR 2SA1162	
Q2904	WA2-0481-000 000	B	1	TRANSISTOR 2SD968A	
Q2931	WA2-0797-000 201	B	1	TRANSISTOR 2SA1213	
Q2951	WA2-0393-000 201	B	1	TRANSISTOR 2SA1162	
Q2952	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
Q2953	WA2-0735-000 201	B	1	TRANSISTOR 2SC2712	
⚠ RR101	DH4-0142-000 000	D	1	LINK IC ICP-F15	
⚠ RR601	DH4-0144-000 000	D	1	LINK IC ICP-F25	
⚠ RR2931	DH4-0144-000 000	D	1	LINK IC ICP-F25	
⚠ RR2932	DH4-0142-000 000	D	1	LINK IC ICP-F15	
⚠ RR2933	DH4-0142-000 000	D	1	LINK IC ICP-F15	
⚠ RR2934	DH4-0166-000 000	D	1	LINK IC DZ000	
⚠ T2901	DH9-0456-000 000	D	1	FLYBACK, TRANSFORMER	
VC601	VC6-0340-300 000	C	1	CAPACITOR, TRIMMER 30pF	
VC2001	VC6-0340-100 000	C	1	CAPACITOR, TRIMMER 10pF	
VC2002	VC6-0340-100 000	C	1	CAPACITOR, TRIMMER 10pF	
VC2401	VC6-0340-300 000	C	1	CAPACITOR, TRIMMER 30pF	
VC2941	VC5-9700-300 000	C	1	CAPACITOR, TRIMMER 30pF	
VR101	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10kΩ	

REF.No.D15-3230,3270

ELECTRICAL PARTS

	SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	VR102	VR5-7780-103 000	C	1	R STOR, ABLE 10KΩ	
	VR103	VR5-7780-223 000	C	1	R STOR, ABLE 22KΩ	
	VR104	VR5-7780-103 000	C	1	RESISTOR, ABLE 10KΩ	
	VR105	VR5-7780-222 000	C	1	RESISTOR, VARIABLE 2.2KΩ	
	VR106	VR5-7780-222 000	C	1	RESISTOR, VARIABLE 2.2KΩ	
	VR107	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR108	VR5-7780-222 000	C	1	RESISTOR, VARIABLE 2.2KΩ	
	VR109	VR5-7780-332 000	C	1	RESISTOR, VARIABLE 3.3KΩ	
	VR110	VR5-7780-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR111	VR5-7780-223 000	C	1	RESISTOR, VARIABLE 22KΩ	
	VR112	VR5-7780-102 000	C	1	RESISTOR, VARIABLE 1KΩ	
	VR113	VR5-7780-223 000	C	1	RESISTOR, VARIABLE 22KΩ	
	VR401	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR602	VR5-7780-104 000	C	1	RESISTOR, VARIABLE 100KΩ	
	VR603	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2101	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2201	VR7-0520-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR2202	VR7-0520-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2203	VR7-0520-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2204	VR7-0520-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2205	VR7-0520-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2206	VR7-0520-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2207	VR7-0520-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR2401	VR7-0520-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR2402	VR7-0520-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR2403	VR7-0520-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2404	VR7-0520-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2405	VR7-0520-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
	VR2651	VR7-0520-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR2652	VR7-0520-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR2653	VR7-0520-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR2654	VR7-0520-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
	VR2901	VR5-7680-201 000	C	1	RESISTOR, VARIABLE 200Ω	
	VR2902	VR5-7680-503 000	C	1	RESISTOR, VARIABLE 50KΩ	
⚠	VR2903	VR5-4640-205 000	C	1	RESISTOR, VARIABLE 2MΩ	
	VR2904	VR5-4640-504 000	C	1	RESISTOR, VARIABLE 500KΩ	
	VR2961	VR5-7680-503 000	C	1	RESISTOR, VARIABLE 50KΩ	

REF.No.D15-3230,3270

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
2	DA1-1702-000 000	B	1	HOOD	
2	DA1-1811-000 000	C	1	CUSHION, RUBBER	
2	DA1-1815-000 000	F	1	SCREW, CROSS-RECESS	
2	DA1-1864-000 000	B	1	RING, RUBBER	
6	DA1-1948-000 000	C	3	SCREW, CROSS-RECESS	
4	DA1-2138-000 000	C	1	SHEET	
2	DA1-2457-000 000	B	1	RING, E.V.F.	
2	DA1-2460-000 000	B	1	KNOB, T/W	
2	DA1-2461-000 000	C	1	PLATE	
2	DA1-2463-000 000	C	2	TERMINAL, BATTERY	
2	DA1-2486-000 000	B	1	SHOE, ACCESORY	
2	DA1-2489-000 000	B	1	SHEEET, ACCESORY SHOE	
2	DA1-2514-000 000	B	2	SEAL	
2	DA1-2517-000 000	B	1	KNOB, BATTERY	
2	DA1-2518-000 000	B	1	SEAL	
2	DA1-2598-000 000	B	1	KNOB, GRIP	
2	DA1-2600-000 000	C	1	PLATE	
4	DA1-2770-000 000	C	1	HOLDER, CAMERA (B)	
4	DA1-2773-000 000	C	1	PLATE, TRIPOD	
6	DA1-2777-000 000	C	1	HOLDER (A), RECORDER	
6	DA1-2778-000 000	C	1	HOLDER (B), RECORDER	
2	DA1-2793-000 000	B	1	KNOB, EJECT	
6	DA1-2795-000 000	C	1	TERMINAL, BATTERY	
6	DA1-2796-000 000	C	1	TERMINAL, BATTERY	
2	DA1-2898-000 000	C	1	SEAL, PC	
2	DA1-4132-000 000	B	1	STRAP, HAND	VCC810 ONLY
2	DA1-4068-000 000	B	1	COVER, BATTERY	
4	DA1-4077-000 000	C	1	HOLDER, PCB	
2	DA1-4080-000 000	B	1	CAP, AV	
2	DA1-4081-000 000	B	1	KNOB, POWER	
2	DA1-4085-000 000	C	1	HOLDER, DC/DC	
4	DA7-1724-000 000	C	1	STOPPER, NEARDISTANCE	
4	DA7-1734-000 000	C	1	STOPPER, RUBBER	
4	DA7-1792-000 000	C	1	BLIND, IG METER (B)	
4	DA7-2003-000 000	B	1	SHEET, ZOOM	
2	DF1-0865-000 000	B	1	CAP, LENS	VCC810 ONLY
6	DF1-0562-000 000	C	1	PRINTED CORD	
2	DF1-0867-000 000	B	1	COVER, CASSETTE	VCC810 ONLY
4	DF7-0231-000 000	C	1	BLIND, IG METER (A)	
6	DG1-0828-000 000	C	1	JOG C.B.A.	
4	DG1-0843-000 000	C	1	SENSOR C.B.A.	
4	DG1-0844-010 000	C	1	PROCESS C.B.A.	
6	DG1-0894-000 000	C	1	REMOCON C.B.A.	
2	DG1-0895-000 000	C	1	MIC JACK C.B.A.	
6	DG1-0898-000 000	C	1	RECORDER KEY C.B.A.	
2	DG1-0930-000 000	C	1	GRIP C.B.A.	
2	DG1-1362-000 000	B	1	LEFT COVER, GRIP	VCC810 ONLY
6	DG1-1331-000 000	C	1	RECORDER MAIN C.B.A.	E50E ONLY
2	DG9-0181-000 000	B	1	LENS COVER ASS'Y	VCC810 ONLY
2	DG9-0177-000 000	B	1	LENS COVER ASS'Y	E50F ONLY
4	DG9-3384-000 000	C	1	RELAY LENS ASS'Y	
4	DG9-3449-000 000	C	1	AF MOTOR ASS'Y	
4	DG9-3450-000 000	C	1	P2 MOTOR ASS'Y	
6	DH2-1098-000 000	C	1	PRINTED CORD	
4	DH3-0015-000 000	C	1	DC/DC CONVERTER	
	DH4-0029-000 000	B	1	IC CX20114	
	DH4-0030-000 000	B	1	IC CX20115	
	DH4-0124-000 000	B	1	IC MN53015CXZ	
	DH4-0125-000 000	B	1	IC MN53015CXY	
	DH4-0135-000 000	B	1	IC CXA1204Q	

PARTS LIST

	PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
		DH4-0139-000 000	B	1	IC CXL1502M	
⚠		DH4-0142-000 000	D	3	LINK, IC ICP-F15	
⚠		DH4-0144-000 000	D	2	LINK, IC ICP-F25	
		DH4-0155-000 000	B	1	IC μPD6145G-101	
⚠		DH4-0166-000 000	D	1	LINK, IC D2000	
		DH4-0180-001 000	B	1	IC CXA1200BQ	
		DH4-0189-000 000	B	1	IC CXA1127M	
		DH4-0190-000 000	B	1	IC CXA1237AR	
		DH4-0205-000 000	B	3	IC LVC556	
		DH4-0225-000 000	B	1	IC MM33-1002F	
		DH4-0228-000 000	B	1	IC AN2154FAP	
		DH4-0235-000 000	B	1	IC CXP80116	
		DH4-0236-000 000	B	1	IC MM1019	
		DH4-0240-000 000	B	1	IC μPD7508G-E97	
	6	DH4-0243-000 000	C	1	HEAD AMP C.B.A.	
	4	DH4-0247-000 000	C	1	AWB C.B.A.	
	4	DH4-0248-000 000	B	1	CCD MN3746NC	
	4	DH4-0250-000 000	C	1	ENCORDER C.B.A.	
	4	DH8-0045-000 000	C	1	IG METER	
	6	DH9-0341-000 000	C	1	PIN JACK ASS'Y	
	2	DH9-0510-000 000	C	1	MICROPHONE ASS'Y	VCC810 ONLY
⚠		DH9-0456-000 000	D	1	FLYBACK, TRANSFORMER	
⚠		DH9-0459-000 000	C	1	COIL, 184uH	
	4	DH9-0483-000 000	C	1	CRYSTAL FILTER ASS'Y	
	2	DS1-5185-000 000	C	1	SPRING, COIL	
	4	DS1-5198-000 000	C	1	SPRING, COIL	
	4	DY1-7118-000 000	B	1	ZOOM RING ASS'Y	
	4	DY1-7119-000 000	C	1	AF BLOCK ASS'Y	
	4	DY1-7121-000 000	C	1	ZOOM LENS ASS'Y	
	4	DY1-7122-000 000	C	1	FOCUS LENS ASS'Y	
	2	DY2-1159-000 000	C	1	CRT ASS'Y	
	2	DY1-5005-000 000	B	1	WIRELESS CONTROLLER VWR880	VCC810 ONLY
	2	DY2-1202-000 000	B	1	WIRELESS CONTROLLER WL-400F	E50F ONLY
	2	DY1-5004-000 000	B	1	RIGHT COVER ASS'Y	VCC810 ONLY
	2	DY2-1217-000 000	B	1	RIGHT COVER ASS'Y	E50F ONLY
	6	DY2-1218-000 000	C	1	RECORDER MAIN C.B.A.	E50F ONLY
	2	DY2-1219-000 000	B	1	RIGHT COVER, GRIP	
	2	DY2-1221-000 000	B	1	LEFT COVER ASS'Y	
	2	DG9-0182-000 000	B	1	TOP COVER ASS'Y	VCC810 ONLY
	2	DY3-4197-000 000	B	1	COVER, BATTERY	
	10,12	DY4-2440-000 000	F	3	WASHER	
	8	DY4-2452-000 000	F	3	SCREW	
	12	DY4-2527-000 000	F	1	WASHER	
	12	DY4-2648-000 000	C	1	COASTER, LEFT	
	12	DY4-2649-000 000	C	1	COASTER, RIGHT	
	12	DY4-2650-000 000	C	1	GEAR, ASS'Y	
	8	DY4-2651-000 000	C	1	LOADING MOTOR ASS'Y	
	8	DY4-2652-000 000	C	1	ROLLER ASS'Y	
	10	DY4-2653-000 000	C	1	ARM, PINCH	
	12	DY4-2654-000 000	C	1	GEAR, ASS'Y	
	12	DY4-2655-000 000	C	1	LEVER, THREADING	
	12	DY4-2656-000 000	C	1	GEAR, JOINT	
	10	DY4-2657-000 000	C	1	LEVER, SWITCH	
	12	DY4-2658-000 000	C	1	WORM ASS'Y	
	12	DY4-2659-000 000	C	1	BRAKE, TS	
	10	DY4-2660-000 000	C	1	BAND, TENSION	
	12	DY4-2661-000 000	C	1	GEAR	
	12	DY4-2662-000 000	C	1	ROLLER, GUIDE	
	10	DY4-2663-000 000	C	1	REEL, SUPPLY	
	10	DY4-2664-000 000	C	1	ARM, TG7	

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PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
12	DY4-2665-000 000	C	1	ARM, PINCH SUB	
10	DY4-2666-000 000	C	1	REEL, TAKE UP	
12	DY4-2667-000 000	C	1	GEAR	
12	DY4-2668-000 000	C	1	GEAR	
10	DY4-2669-000 000	C	1	ARM	
12	DY4-2671-000 000	C	1	PULLY, RELAY	
12	DY4-2672-000 000	C	1	PLATE, SS	
8	DY4-2673-000 000	C	1	CASSETTE COMPARTMENT ASS'Y	
12	DY4-2674-000 000	C	1	ROLLER, GUIDE	
8	DY4-2675-000 000	C	1	TERMINAL, EARTH	
10	DY4-2676-000 000	C	1	SWITCH	
10	DY4-2677-000 000	C	1	SWITCH, SLIDE	
10	DY4-2678-000 000	C	1	SWITCH, PUSH	
10	DY4-2679-000 000	C	1	FLEXIBLE C.B.A. (1)	
10	DY4-2680-000 000	C	1	FLEXIBLE C.B.A. (2)	
10,12	DY4-2681-000 000	F	4	WASHER	
12	DY4-2684-000 000	C	1	PLATE, TT	
12	DY4-2685-000 000	C	2	SPRING, LEAF	
12	DY4-2686-000 000	F	2	SCREW, CROSS-RECESS	
12	DY4-2687-000 000	C	1	GEAR, WHEEL	
10,12	DY4-2688-000 000	F	6	WASHER	
12	DY4-2689-000 000	F	2	SCREW, CROSS-RECESS	
10	DY4-2690-000 000	C	1	PLATE, TL	
10	DY4-2691-000 000	C	1	BRAKE, LB	
10	DY4-2692-000 000	C	1	LEVER, LB	
12	DY4-2693-000 000	C	1	ARM, RELEASE	
12	DY4-2694-000 000	C	1	GEAR, UL	
12	DY4-2695-000 000	C	1	ARM, UL	
10	DY4-2696-000 000	C	4	PIN, SHAFT	
10	DY4-2697-000 000	C	1	SPRING, COIL	
12	DY4-2698-000 000	C	1	SPRING, COIL	
10	DY4-2699-000 000	C	1	SPRING, COIL	
12	DY4-2700-000 000	C	1	SPRING	
10	DY4-2701-000 000	C	1	FLANGE, TG2	
10	DY4-2702-000 000	C	1	ROLLER, TG2	
10	DY4-2703-000 000	C	1	FLANGE, TG2	
10	DY4-2704-000 000	C	1	SLEEVE, TG2	
10	DY4-2705-000 000	C	1	SPRING, COIL	
12	DY4-2706-000 000	C	1	SPRING, COIL	
10	DY4-2707-000 000	C	1	SPRING, PLATE	
8	DY4-2708-000 000	C	1	SPRING, COIL	
8	DY4-2709-000 000	C	1	GEAR, DAMPER	
10	DY4-2710-000 000	C	1	HOLDER, LED	
12	DY4-2711-000 000	C	1	LEVER, EJECT	
10	DY4-2712-000 000	C	1	ARM, RELEASE	
10	DY4-2713-000 000	C	1	BRAKE, S	
10	DY4-2714-000 000	C	1	BRAKE, T	
12	DY4-2715-000 000	C	1	BRAKE, UL	
10	DY4-2716-000 000	C	1	ARM, STOPPER	
10	DY4-2717-000 000	C	1	ARM, ADJUST	
12	DY4-2718-000 000	E	1	BELT (L), TIMING	
12	DY4-2719-000 000	E	1	BELT (S), TIMING	
8	DY4-2720-000 000	C	1	DAMPER, OIL	
8	DY4-2721-000 000	C	1	GUARD, GUIDE	
10	DY4-2722-000 000	C	2	HOLDER, SENSOR	
10	DY4-2723-000 000	C	1	STOPPER, RK	
10	DY4-2724-000 000	C	1	SPRING, COIL	
10	DY4-2725-000 000	C	1	PLATE, SWITCH	
8	DY4-2726-000 000	C	1	CAPSTAN MOTOR	
8,10	DY4-2727-000 000	F	11	SCREW, CROSS-RECESS	

REF.No.D15-3230,3270

PARTS LIST

	PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	8,10,12	DY4-2728-000 000	F	7	SCREW, CROSS-RECESS	
	8	DY4-2729-000 000	C	2	TAPE	
	8	DY4-2730-000 000	F	5	SCREW, CROSS-RECESS	
	8	DY4-2732-000 000	E	1	DRUM ASSS'Y	
	8	DY4-2733-000 000	E	1	UPPER DRUM ASS'Y	
⚠		VC5-9520-102 000	C	1	CAPACITOR, CERA. 1000pF 1KV	
		VC5-9700-300 000	C	1	CAPACITOR, TRIMMER 30pF	
⚠		VC5-9850-332 003	C	1	CAPACITOR, FILM 3300pF 100V	
		VC6-0340-100 000	C	2	CAPACITOR, TRIMMER 10pF	
		VC6-0340-300 000	C	2	CAPACITOR, TRIMMER 30pF	
⚠		VC6-1570-152 000	C	1	CAPACITOR, CERA. 1500pF 500V	
⚠		VR5-4640-205 000	C	1	RESISTOR, VARIABLE 2MΩ	
		VR5-4640-504 000	C	1	RESISTOR, VARIABLE 500KΩ	
		VR5-7680-201 000	C	1	RESISTOR, VARIABLE 200Ω	
		VR5-7680-503 000	C	2	RESISTOR, VARIABLE 50KΩ	
		VR5-7780-102 000	C	1	RESISTOR, VARIABLE 1KΩ	
		VR5-7780-103 000	C	7	RESISTOR, VARIABLE 10KΩ	
		VR5-7780-104 000	C	1	RESISTOR, VARIABLE 100KΩ	
		VR5-7780-222 000	C	3	RESISTOR, VARIABLE 2.2KΩ	
		VR5-7780-223 000	C	3	RESISTOR, VARIABLE 22KΩ	
		VR5-7780-332 000	C	1	RESISTOR, VARIABLE 3.3KΩ	
		VR5-7780-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
		VR7-0520-103 000	C	8	RESISTOR, VARIABLE 10KΩ	
		VR7-0520-472 000	C	8	RESISTOR, VARIABLE 4.7KΩ	
		VS1-0875-011 000	C	1	CONNECTOR 11P	
		VS1-0875-013 000	C	1	CONNECTOR 13P	
		VS1-0875-015 000	C	1	CONNECTOR 15P	
		VS1-0875-025 000	C	1	CONNECTOR 25P	
		VS1-1169-025 000	C	1	CONNECTOR 25P	
		WA1-0380-000 000	B	2	DIODE MA157	
		WA1-0384-000 000	B	1	ZENER DIODE RD5.6MB2	
		WA1-0547-000 201	B	2	DIODE 1SS184	
		WA1-0604-000 000	B	1	DIODE MA159	
		WA1-0612-000 201	B	2	DIODE E10QS03	
		WA1-0696-000 201	B	1	DIODE MA152WA	
		WA1-0962-000 000	B	3	DIODE MA121	
		WA1-0989-000 000	B	1	DIODE MA3100W	
		WA1-1084-000 000	B	20	DIODE MA110	
		WA1-1123-000 000	B	1	DIODE AG01Z	
		WA1-1124-000 000	B	1	DIODE SHV02	
		WA1-1146-000 000	B	3	DIODE MA707	
		WA1-1194-000 000	B	1	DIODE MA728	
		WA1-1221-000 000	B	1	DIODE MA341S	
		WA2-0052-000 000	B	3	TRANSISTOR 2SC1621	
		WA2-0393-000 000	B	2	TRANSISTOR 2SA1162	
		WA2-0481-000 000	B	1	TRANSISTOR 2SD968A	
		WA2-0646-000 000	B	1	TRANSISTOR 2SD1328	
		WA2-0735-000 201	B	18	TRANSISTOR 2SC2712	
		WA2-0759-000 000	B	4	TRANSISTOR DTA144EK	
		WA2-0760-000 000	B	1	TRANSISTOR DTC114TK	
		WA2-0797-000 201	B	4	TRANSISTOR 2SA1213	
		WA2-0839-000 000	B	1	TRANSISTOR 2SA1226	
		WA2-0864-000 000	B	7	TRANSISTOR DTC144EK	
		WA2-1121-000 000	B	1	TRANSISTOR DTC143EK	
		WA2-1172-000 000	B	3	TRANSISTOR 2SA1461	
		WA2-1198-000 000	B	1	TRANSISTOR IMD2	
		WA2-1228-000 000	B	3	TRANSISTOR IMT2	
		WA2-1230-000 000	B	4	TRANSISTOR IMH6	
		WA2-1232-000 000	B	6	TRANSISTOR IMZ1	
		WA2-1234-0[illegible] 000	B	13	TRANSISTOR IMX2	

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PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	WA2-1256-000 000	B	1	TRANSISTOR IMH5	
	WA2-1298-000 000	B	1	TRANSISTOR DTC124TK	
	WA2-1368-000 000	B	2	TRANSISTOR DTC114EK	
	WA2-1436-000 000	B	1	TRANSISTOR 2SB962-Z	
	WA2-1496-000 000	B	1	TRANSISTOR IMB8	
	WA2-1498-000 000	B	10	TRANSISTOR 2SA1162	
	WA2-1501-000 000	B	1	FET 2SK198	
	WA3-3679-000 000	B	1	IC MN3820S	
	WA3-3900-000 000	B	1	IC μPD6147G	
	WA4-0349-000 201	B	1	IC NJM2904M	
	WA4-0458-000 000	B	1	IC NJM3414M	
	WA4-0509-000 000	B	1	IC NJM2043M	
	WA4-0901-000 000	B	1	IC AN2011S	
	WA4-1145-000 000	B	1	IC RH5VA45AA	
	WA4-1167-000 000	B	1	IC RH5RA50AA	
	WA4-1231-000 000	B	1	IC LB1631M	
	WA4-1322-000 000	B	1	IC AN2514S	
4	XA1-6200-407 000	F	1	SCREW, CROSS-RECESS, PH	
2	XA1-6200-509 000	F	6	SCREW, CROSS-RECESS, PH	
2	XA1-6200-759 000	F	2	SCREW, CROSS-RECESS, PH	
4,6	XA1-7200-307 000	F	11	SCREW, CROSS-RECESS, PH	
2	XA1-7200-359 000	F	2	SCREW, CROSS-RECESS, PH	
2	XA1-7200-407 000	F	1	SCREW, CROSS-RECESS, PH	
2	XA1-7200-409 000	F	2	SCREW, CROSS-RECESS, PH	
2	XA1-7260-709 000	F	4	SCREW, CROSS-RECESS, PH	
4	XA4-2170-707 000	F	2	SCREW, CROSS-RECESS, PH	
4	XA4-3200-507 000	F	2	SCREW, CROSS-RECESS, PH	
4	XA4-4170-407 000	F	1	SCREW, CROSS-RECESS, PH	
4	XA4-4200-507 000	F	1	SCREW, CROSS-RECESS, PH	
2	XA4-7200-459 000	F	5	SCREW, CROSS-RECESS, PH	
2	XA4-7200-609 000	F	1	SCREW, CROSS-RECESS, PH	
4	XA4-8260-509 000	F	2	SCREW, CROSS-RECESS, PH	
4	XA4-9170-557 000	F	3	SCREW, CROSS-RECESS, PH	
2	XA4-9200-409 000	F	3	SCREW, CROSS-RECESS, PH	
4	XA4-9200-509 000	F	4	SCREW, CROSS-RECESS, PH	
4	XA4-9200-609 000	F	3	SCREW, CROSS-RECESS, PH	
2	XA4-9260-709 000	F	4	SCREW, CROSS-RECESS, PH	
2	XA9-0435-000 000	F	2	SCREW, CROSS-RECESS, PH	
2	XA9-0503-000 000	F	3	SCREW, CROSS-RECESS, PH	
4	XB4-6260-607 000	F	1	SCREW M2.6X6	
4	X96-1723-610 000	F	2	SCREW, SLOTTED SHOULDER	
4	YA1-0031-000 000	C	1	HOLDER, CAMERA (A)	
4	YG9-5010-000 000	C	1	AF C.B.A.	
10	Y22-8012-000 000	B	1	LED GL452S	
8	Y22-8120-000 000	B	1	SENSOR, DEW	
10	Y22-8121-000 000	B	2	PHOTO IC SFI-315-25-BD	
10	Y22-8123-000 000	B	2	PHOTO TRANSISTOR EE-P109	

Canon

Canovision 8

SERVICE MANUAL

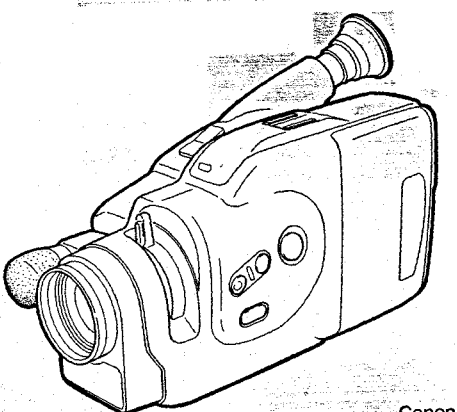
E30E,F

(REF.NO.D15-2330,2370)

8mm Video Camera & Recorder

PAL

SECAM



Canon Inc.
Video Technical Service Dept.
First Edition: Oct. 1989
Printed in Japan

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SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine CANON replacement parts.
   Especially critcal parts in the power circuit block should not be replaced with other makes.
   Critical parts are marked with ⚠ in the schematic diagrams.
2. The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in the viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, CANON approved one.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been oberheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

5-1 Leakage Current Cold Check

1) Unplug the AC cord and connect a jumper between the two prongs on the plug.
2) Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metalic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metalic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ. When the exposed metal does not have a return path to the chassis, the reading must be ∞.

5-2 Leakage Current Hot Check

1) Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2) Connect a 1.5kΩ 10 watt resistor, paralleled by 0.15μF capacitor, between each exposed metalic parts on the unit and a good earth ground such as a water pipe, as shown in figure 1.
3) Use an AC voltmeter, with 1000Ω volt or more sensitivity, to measure the potential across the resistor.
4) Check all exposed metallic parts of the cover (Cable connection, Handle bracket, metallic cabinet. Screwheads, Metallic overlays, etc), and measure the voltage at each point.
5) Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6) The potential at any point should not exceed 0.75V RMS.
   A leakage current tester (FLUKE MODEL: 8000A equivalent) may be used to make the hot checks.
   Leakage current must not exceed 0.5 milliamp.
   In case a measurement is out side of the limits specified, there is a possibility of a shock hazard, and corrective action must be taken before returning the instrument to the customer.

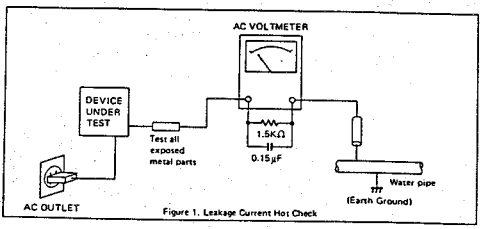

Figure 1. Leakage Current Hot Check

BOSCH-BAUER
VCC820AF

Service Manual

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CHAPTER I. GENERAL DESCRIPTION OF PRODUCT

1. Product Overview

The Model E30E,F, developed as a successor to E80E,F, provides impressive combination of the new features - double function keys, dual beam autofocusing, automatic backlight correction - with the inherited features of "Flexigrip" and power-on full automatic system.

1-1 Major features

1) Excellent picture quality

- * High-performance 6x power zoom lens
- * Flying erase head
- * Full-auto white balancing (TTL)
- * Center-emphasis averaging photometry

2) Functionalities

- * Near-infrared dual beam autofocusing
- * High-speed search (SP: 14 x fast motion, LP: 28 x fast motion)
- * Linear time counter
- * Video-audio synchronous fading
- *-Auto date/title character generation
- * Self interval timer

3) Operabilities

- * EVF built-in rotary "Flexigrip"
- * Wireless controller (WL-400) provided
- * Double function keys
- * Recording search
- * Recording reminder (10-sec counter)

1-2 Major characteristics of each section

Table I-1 shows the major characteristics of each section in Model E30E,F.

Table I-1

Lens	Camera			Recorder			GRIP circuit
	AF circuit	CCD	Sensor process circuit	Video circuit	Syscon-servo circuit	Mechanism	
6x tele-macro lensing facility (new design)	Without AI micro-computer incor-porated in E640E,F	320,000 pixels (Effective pixels: 300,000) (new design)	Equivalent to that of E80E,F series Y/C process cir-cuit (IC2203) (new design)	Equivalent to that of E80E,F series	Equivalent to that of E80E,F series	MC-4B two heads, plus fly-ing erase head	Same as that of E640E,F

1-3 Nomenclature

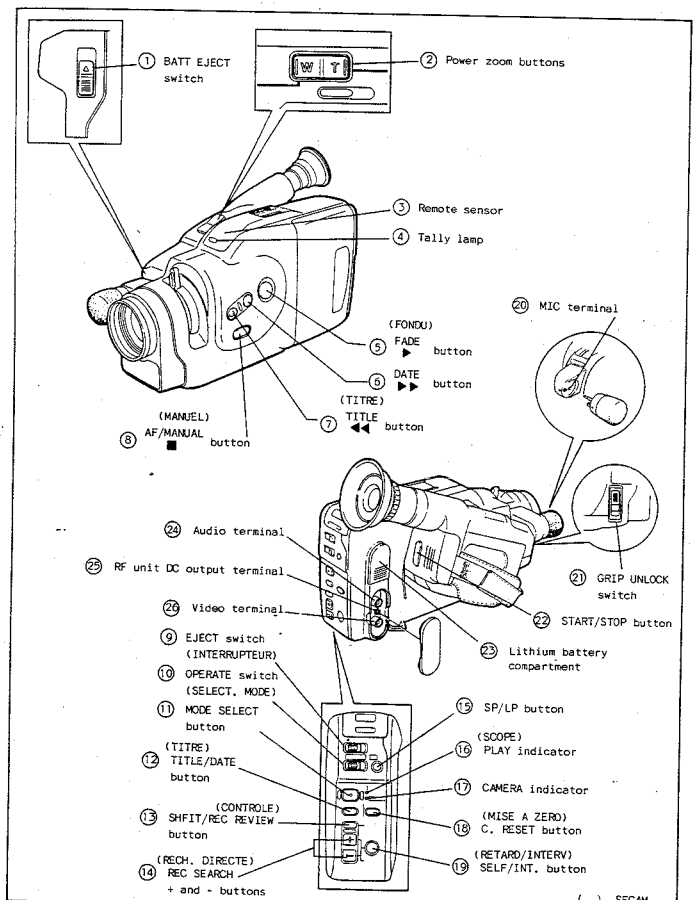


Fig. 1-1

1-4 Brief explanation of control buttons and terminals

① **BATT EJECT switch**
Slid this switch when taking the battery from the battery box.

② **Power zoom buttons** [W/T]
By pressing these buttons, an angle of view is zoomed in/out to wide/telephoto direction.

③ **Remote sensor**
The remote control signal is received through this window.

④ **Tally lamp**
This lamp flashes during the recording, self-timer or the interval timer operations. Also, it lights up when the remote control signal is received.

Recording	flashes at 1Hz
Self-timer	ON: 0.5sec. OFF: 1.5sec
Interval timer	ON: 0.5sec. OFF: 1.5sec
Remote controller used	lights up

⑤, ⑥, ⑦ and ⑧ buttons

According to modes, CAMERA MODE/PLAY MODE, buttons ⑤, ⑥, ⑦ and ⑧ function in two ways, respectively as follows. For selecting CAMERA MODE/PLAY MODE, push ⑪ MODE SELECT button.

⑤ **FADE ▶ button**

CAMERA MODE: **FADE button** [FADE] (FONDU)
When this button is pressed and held on for 4 minutes or more, the picture and sound disappear gradually (fading out). By releasing, they appear gradually (fading-in). The fading is not interlinked with the trigger button.

PLAY MODE : **PLAY button** [▶]
Pressing this button starts playback operation.

⑥ **DATE ▶▶ button**

CAMERA MODE: **DATE button** [DATE]
Pressing this button in camera mode presents the date/time indication on the viewfinder screen. In camera recording, the date/time can be imposed on pictures.

Date/time not displayed (At power-on) ⇨ 1.JAN.1990 (Only date displayed) ⇨ Date/time not displayed ⇨ 12:34 AM (Only time displayed) ⇨ Date/time not displayed ⇨ 12:34 AM 1. JAN. 1990 (Date and time displayed)

PLAY MODE : **FAST FORWARD button** [▶▶]
Pressing this button in the pause state causes the tape to be fed fast. If it is held down during playback, the pictures are playbacked rapidly (at a speed of 9 x fast motion). When it is released, the machine resumes normal playback operation. Also, if this button is held down for fast-forward operation, the fast-forward playback operation (SP: 14 x fast motion, LP: 28 x fast motion) is continued.

⑦ **TITLE ◀◀ button**

CAMERA MODE: **Title button** [TITLE] (TITRE)
Pressing this button in the camera mode presents the memorized title on the viewfinder screen. In the camera recording, the user-created title can be imposed on pictures.

PLAY MODE : **Rewind button** [◀◀]
Pressing this button in stop mode rewinds the tape. And, holding down this button in the playback mode reproduces the fast-motion pictures (7 x fast motion). In the playback mode, releasing this button causes the machine to perform normal playback again. Also, if it is held down during tape rewinding, the pictures are playbacked backward rapidly as the tape goes back (SP: 14 x fast motion, LP: 28 x fast motion).

⑧ **AF/MANUAL ■ button**

CAMERA MODE: **AF/MANUAL button** [AF/MANUAL]
When pressed in camera mode, auto focusing and manual focusing are selected alternately. In manual focusing mode, "M. FOCUS" appears in the EVF. Immediately after the power turned on, AF mode is set automatically.

PLAY MODE : **Stop button** [■]
Pressing this button causes tape drive to stop.

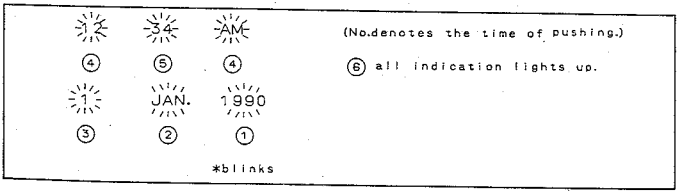
⑨ **EJECT switch** [⏏ EJECT]
In other than the recording mode, pressing this switch eject the cassette tape.

⑩ **OPERATE switch** [OPERATE] (INTERRUPTEUR)
Used to turn power on/off.

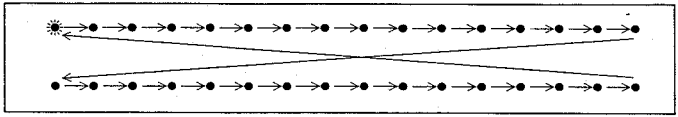
⑪ **MODE SELECT button** [MODE SELECT] (SELECT MODE)
By pressing this button, buttons from ⑤ through ⑧ can be functioned in two ways respectively. Whenever the power switch is turned on, it is set to CAMERA mode automatically. (See the explanation of ⑤ through ⑧ above.)

⑫ **TITLE/DATE button** [TITLE/DATE] (TITRE/DATE)
By pressing this button once, the title mode is set. Then, by manipulating the plus/minus and the SHIFT buttons, the title can be created. On completion of the title making, press the title/date button again. This stops the blinking of title.
When this button is pressed for more than 3 seconds, "years, months, days/hours, minutes" mode is set. By manipulating each button, the displayed prompt can be changed.

⑬ **SHIFT/REC REVIEW button** [SHIFT-REC REVIEW] (SHIFT-CONTROLE)
Used for setting the auto date function.
Each press of this button shifts the prompt from "years" to "months", "days", "hours" and "minutes".



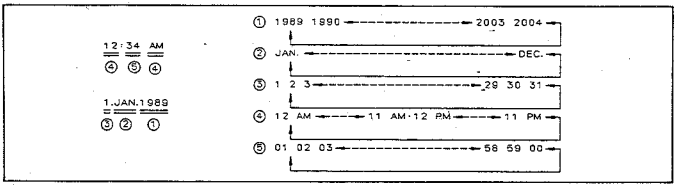
Used for shifting the character position of title (16 characters on 2 lines)



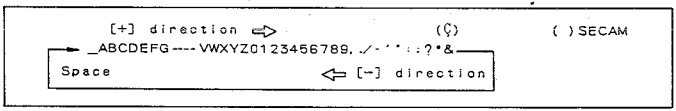
In the recording pause mode, by pressing of this button the previous recording for approx. 3 seconds is played back to allow the user to check it.

⑭ **REC SEARCH/+ and - buttons** [REC SEARCH] (REC. DIRECTE)

* Any setting is allowed for the auto date function (years, months, days, hours, minutes).



* Usable for selection of alphanumeric character/special symbol in title.



* In recording pause state, by pressing and holding down the + button, the tape is playbacked forward, and by pressing and holding down the - button, the tape is playbacked backward. By releasing these buttons, the recording pause mode enters again.

* Selection of timer recording mode
When the [+] button pressed at timer recording mode, the cursor (→) advances, and it returns by pressing the [-] button from the timer mode setting.

⑮ **SP/LP button** [SP/LP]

SP or LP recording mode is selectable at REC PAUSE FF, REW or STOP mode.

⑯ **PLAY indicator** [PLAY] (SCOPE)

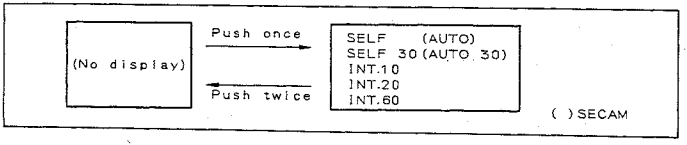
Lights up in PLAY mode. Also, it blinks for warning when an insufficient power, a dew condensation, etc. are detected.

⑰ **CAMERA indicator** [CAMERA]

Lights up in CAMERA mode. Also, it blinks for warning when an insufficient power, a dew condensation, etc. are detected.

⑱ **C. RESET button** [C. RESET] (MISE A ZERO)
In any mode, pressing this button causes the linear tape counter to be reset to 0:00:00.

⑲ **SELF/INT. button** [SELF/INT.] (RETARD/INTERV)
By pressing this button once in the recording pause mode, "Self-Interval" indication is displayed on viewfinder screen. For releasing, push the button again.



⑳ **MIC terminal** [MIC]
Used as a terminal for the regular microphone and the external monaural microphone.

㉑ **GRIP UNLOCK switch** [GRIP UNLOCK]
By pressing and holding down this button, the grip can be rotated.
The grip is fixed by releasing this button.

㉒ **START/STOP button**
Pressing this button in the recording pause state causes the machine to resume recording.
When this button is pressed again, the recording pause state is set up again.
This button is also usable to start/cancel the self/interval timer function.
Pressing this button during playback causes the machine to go to the still playback mode.
When this button is pressed in the still playback mode, the machine goes back to the normal playback mode.

㉓ **Lithium battery compartment**
Contains the lithium battery for auto date function. The lithium battery has a service life of approx. one year.

㉔ **Audio terminal**
Output terminal for audio signal.

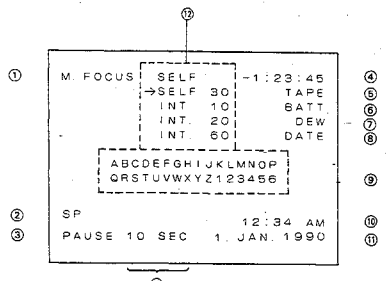
㉕ **RF unit DC output terminal**
Used for power supply (+5 V) terminal when connected with the RF unit (RU-E3).

㉖ **Video terminal**
Output terminals for video signal.

1-5 Information display on electronic viewfinder (EVF)

Press ON SCREEN button on wireless controller to see viewfinder displays ③ and ④ on a connected TV screen.

* Only title, date and time are recorded with scenes.



( ): SECAM

No.	Mode	Display	Description
①	Focus	No display	Autofocus
		M. FOCUS (MANUEL)	Manual focus
	Camera/Play	No display	Camera operation
		PLAY (SCOPE)	Playback operation
		MODE	
②	Tape Speed	SP	Standard play
		LP	Long play
③	Operation	PAUSE	Record pause
		REC (ENR)	Recording
		PLAY (LECT.)	Normal playback fast forward playback or rewind playback
		STILL (ARRET)	Still playback
		STOP	Stop
		FF (AVAN.)	Fast forward or fast forward search
		REW (RET.)	Rewind or rewind search
		EJECT	Eject function is operated
		EJECT[flashes]	Safety mechanism functions
④	Tape Counter	– 4:16:59 to 4:16:59	Tape counter reading
⑤	Tape Status	TAPE[flashes]	No cassette is loaded or an unrecordable cassette is loaded
		T.END (BANDE)	Tape reaches the end
⑥	Battery Warning	BATT[flashes]	Battery charge is nearly exhausted

No.	Mode	Display	Description
⑦	Condensation Warning	DEW [flashes] (COND)	Condensation is detected in camera
⑧	Lithium Battery Warning	DATE [flashes]	Lithium battery charge is low or no battery is inserted
⑨	Title	2 lines × 16 characters	Alphabet (A-Z), numerals (0-9), and 12 symbols
⑩	Time	12:00 AM to 11:59 PM	Present time
⑪	Date	1. JAN. 1989 to 31. DEC. 2004	Current date
⑫	Timer Recording Menu	→ SELF SELF 30 INT.10 INT.20 INT.60	→ Arrow indicates selected mode
⑬	Timer Recording	0SEC — 10SEC 10SEC — 1SEC 30SEC — 1SEC INT.10 INT.20 INT.60	Recording reminder Self timer countdown Self 30 recording 10 sec. interval timer 20 sec. interval timer 60 sec. interval timer

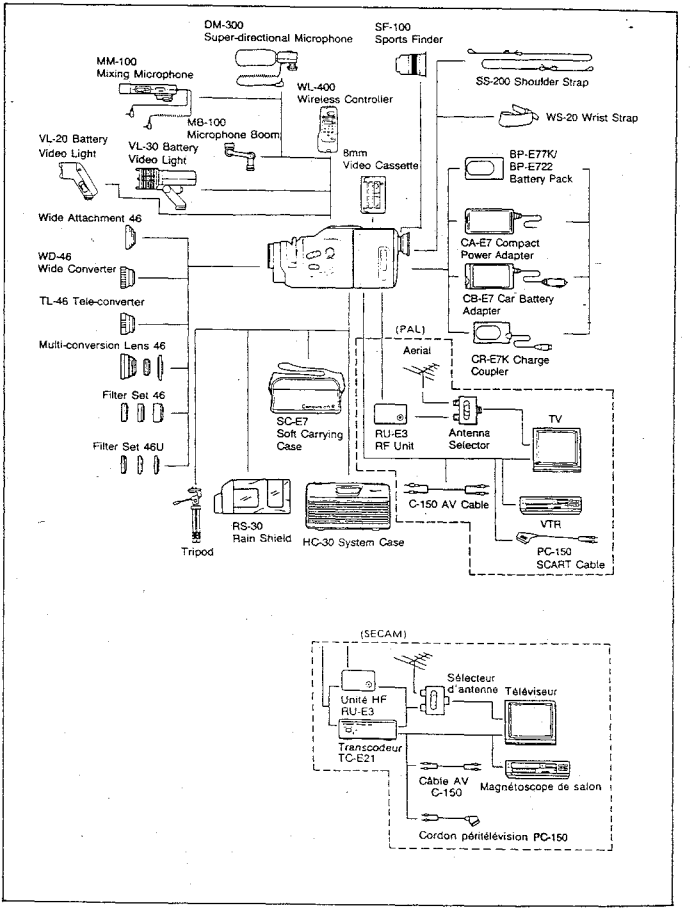

DM-300
Super-directional Microphone
SF-100
Sports Finder
MM-100
Mixing Microphone
WL-400
Wireless Controller
SS-200 Shoulder Strap
WS-20 Wrist Strap
MB-100
Microphone Boom
VL-20 Battery
Video Light
VL-30 Battery
Video Light
8mm
Video Cassette
BP-E77K/
BP-E722
Battery Pack
Wide Attachment 46
CA-E7 Compact
Power Adapter
WD-46
Wide Converter
CB-E7 Car Battery
Adapter
TL-46 Tele-converter
(PAL)
Aerial
CR-E7K Charge
Coupler
Multi-conversion Lens 46
Filter Set 46
SC-E7
Soft Carrying
Case
RU-E3
RF Unit
Antenna
Selector
TV
Filter Set 46U
C-150 AV Cable
VTR
RS-30
Rain Shield
HC-30 System Case
PC-150
SCART Cable
Tripod
(SECAM)
Sélecteur
d'antenne
Téléviseur
Unité HF
RU-E3
Transcodeur
TC-E21
Câble AV
C-150
Magnétoscope de salon
Cordon péritélévision PC-150

Fig. I-2

2. New Technologies

2-1 Automatic backlight correction

The automatic backlight correcting function incorporated in this product differs from that employed in E640E,F (microcomputer-controlled). As illustrated in Fig. I-3, a luminance signal attained through the spot metering in center-emphasis averaging photometry is compressed to provide characteristic indicated in Fig. I-4. (Simplified backlight correction)

This approach determines a backlight correction value through luminance signal compression, unlike the evaluated backlight correction in which a backlight correction value is derived from the ratio of average luminance around the perimeter area of screen and at the center area.

A backlight condition takes place when there is such a bright background as clear sky in the scene. Although the backlight correction can be accomplished by compressing a luminance signal attained through entire-area averaging photometry, this product is designed to perform compression on spot metering because of IC configuration. Note that, in the backlight correction for AGC, a luminance signal obtained through the entire-area averaging photometry is compressed as shown in Fig. I-3.

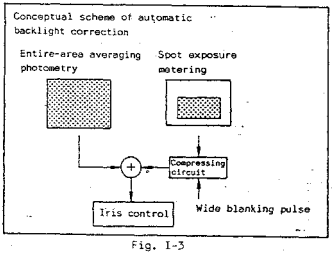


Fig. I-3

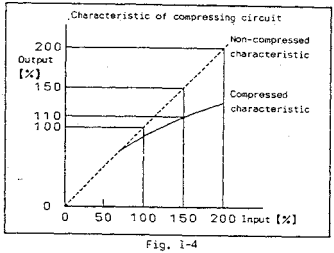


Fig. I-4

Fig. I-5 presents the block diagram of auto backlight correcting circuit. Under a backlight condition with bright background, a luminance signal attained through spot metering on the iris is compressed to suppress closure of the iris. Thus, the backlight correction is accomplished by keeping the iris slightly wider that in the center-emphasis averaging photometry (conventional approach). Since this automatic backlight correcting mechanism carries out backlight correction using a luminance signal obtained from spot exposure metering, closure of the iris is slightly suppressed also when the subject is illuminated with a spot of light (resulting in slightly excessive exposure).

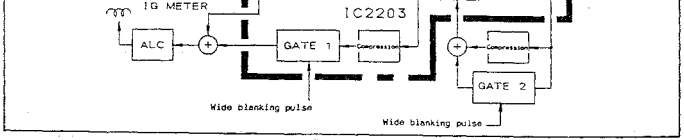


Fig. I-5

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CHAPTER II. DISASSEMBLING/ADJUSTMENTS

1. List of maintenance tools and supplies

1-1 Maintenance tools

DESCRIPTION	TOOL NO.	REMARKS
Alignment tape E (MONOSCO)	DY9-1062-000	
Alignment tape G (V DO Master)	DY9-1064-000	
Recording current checker	DY9-1056-000	
Y/C mix amplifier	DY9-1079-000	
Extension connector kit	DY9-1092-500	(A1E,F)
Extension connector kit	DY9-1102-000	New
Color bar chart	DY9-2002-000	
Logarithmic gray scale chart	DY9-2005-000	
Adjuster (2.6 mm)	DY9-2021-000	
Phillips screwdriver (bit part only)	DY9-2030-000	
Adjuster (1.8 mm)	DY9-2041-000	
Color viewer (5600°K)	DY9-2039-500-220	EUROPE, H.K. etc.
	DY9-2039-500-240	U.K.
Color viewer lamp (5600°K)	DY9-2040-000	
ND-2.0 filter (100 x 100 mm)	DY9-2044-000	

Supplies

DESCRIPTION	TOOL NO.	REMARKS
Screw lock 1401C	CY9-8011-000	
Alonalpha	CY9-8007-000	
Grease GE-C9	CY9-8043-000	
Grease GE-X8	CY9-8044-000	
Grease GE-C4	CY9-8045-000	
Teflon Fluorocarbon Resin MP-102	DY9-3013-000	
Floil G902	DY9-3017-000	

Note: For recorder mechanism, refer to the mechanism manual MC-4B (DY8-3391-501 201) separately issued.

1-2 List of extension connectors

Use the following extension connectors.

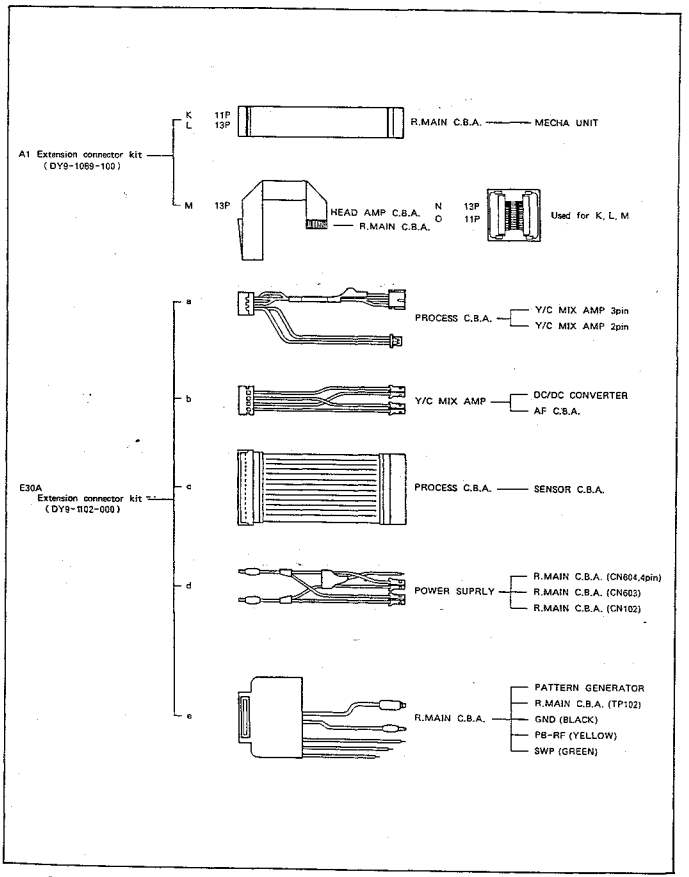


Fig. II-1

2. Disassembling

2-1 Removal/reassembling of covers

2-1-1 Removal of finder assembly, EVF ring, microphone, AV cap and battery cover

(1) Detach the finder assembly, EVF ring, the microphone, the AV cap and the lithium battery cover.

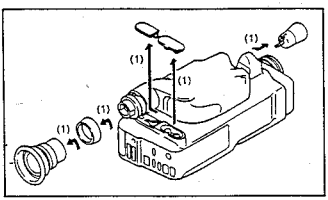


Fig. II-2

2-1-2 Removal of cassette cover

(1) To remove two screws (a), peel off two cassette cover seals.
(2) Detach the cassette cover.

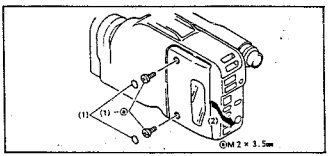


Fig. II-3

2-1-3 Removal of left grip cover

(1) To remove two screws (b) of the rotor side, turn the grip downward by 90°.
(2) Remove two screws (b) of the front side.
(3) Detach the left grip cover.

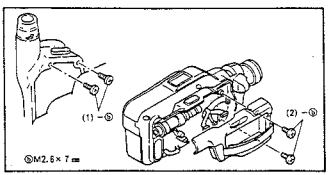


Fig. II-4

2-1-4 Removal of lens cover

(1) Remove two screws (c) and (d).

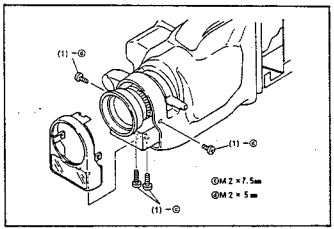


Fig. II-5

* Note: After replacing a lens cover, be sure to perform 4-2 AF distance measurement adjustment.

2-1-5 Removal of left cover

(1) Remove a screw (e).
(2) To remove a screw (f), turn the grip a little as shown in the figure.
(3) Remove four screws (d), two screws (g) and a screw (f).
(4) Unplug four connectors between the GRIP C.B.A. and the main unit.
(5) While pulling out the connectors unplugged in the step (4) from the hole of the grip, detach the left cover.

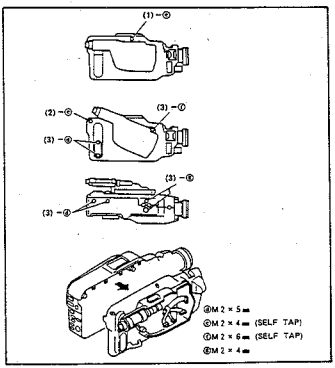


Fig. II-6

2-1-6 Removal of top/right covers

(1) Remove three screws (e).
(2) Take out the top cover.
* Note: Be careful not to damage the claws when detaching/reassembling.
(3) Take out the right cover.

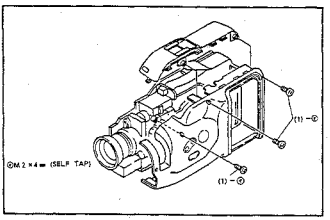


Fig. II-7

2-1-7 Removal of camera and lens units

(1) Unplug connectors between the camera and the recorder units. (CN4005, CN4006)

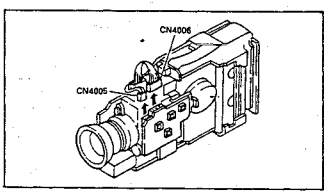


Fig. II-8

(2) While lifting up, detach the camera unit.
(3) Unplug the connectors between the camera and the recorder units. (CN2001)

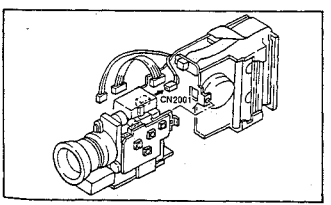


Fig. II-9

2-1-8 Removal of GRIP C.B.A.

(1) Remove three screws (h).
(2) Take out the GRIP C.B.A.

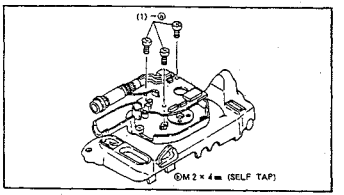


Fig. II-10

2-1-9 Removal of grip right cover

(1) Remove three screws (i).
(2) Detach the grip right cover.

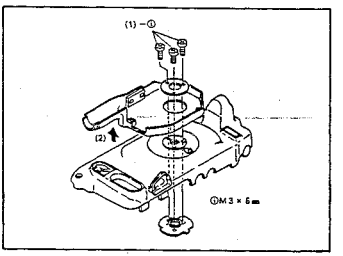


Fig. II-11

CHAPTER II. DISASSEMBLING

1. Disassembling of Camera Section

1-1 Removal of camera holder (2) and PROCESS C.B.A.

(1) To detach the camera holder (2), remove two screws (j).
(2) Detach the PROCESS C.B.A.
(3) Unplug the connectors between the lens unit and the PROCESS C.B.A. (x1)

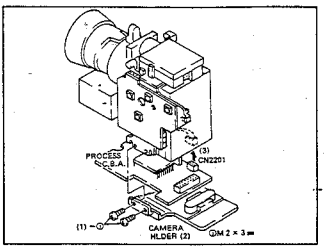


Fig. II-1

1-2 Removal of PROCESS SHIELD and DC/DC converter

(1) Remove a screw (k).
(2) Detach the PROCESS SHIELD.
(3) To detach the DC/DC converter, unhook the claw (A).

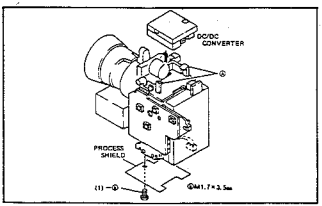


Fig. II-2

1-3 Removal of AF C.B.A.

(1) Remove a screw (n).
(2) Detach the AF C.B.A.
(3) Unplug connectors between the lens unit and the AF C.B.A. (CN4001, CN4002, CN4003, CN4004)

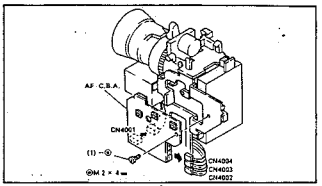


Fig. II-3

1-4 Separation of SENSOR C.B.A., CCD and lens unit

(1) To detach the shield case 2, unsolder the three parts (A) of the shield case.
(2) Remove two screws (l) and two screws (m).
(3) Detach the lens unit.
(4) Unsolder the pins of CCD.
(5) To detach the SENSOR C.B.A., remove two screws (j).
(6) To detach the CCD, remove two screws (l).

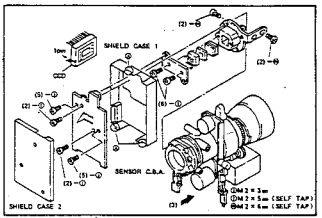


Fig. II-4

1-5 Removal of DC/DC holder

(1) Remove a screws (j).
(2) Detach the DC/DC holder.

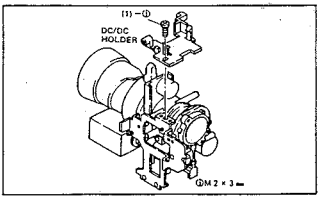


Fig. II-5

2. Disassembling of Lens Section

2-1 Removal of camera holder

(1) Remove two screws (o).
(2) Detach the camera holder.

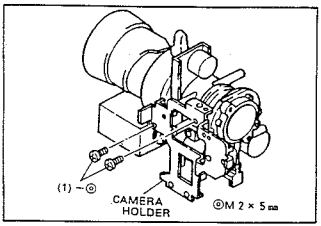


Fig. II-6

2-2 Removal of AF, PZ motors and HOLDER PCB

(1) Remove a screw (m).
(2) Detach the HOLDER PCB.
(3) Remove two screws (p).
(4) Detach the AF and PZ motors.

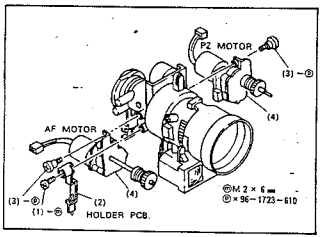


Fig. II-7

2-3 Removal of AF block

(1) Remove two screws (q).
(2) Detach the AF block.

* Notes: 1. When remounting the AF block, make sure that the focusing ring cam surface (A) is interlocked with the prism arm B properly.
2. Do not loosen the screws securing the SPC and IRED C.B.A.s.
3. After remounting the AF block, be sure to perform the AF distance measuring adjustment (4-2).

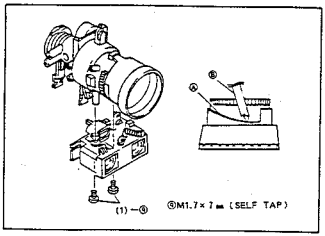


Fig. II-8

2-4 Removal of relay lens assembly

(1) Remove a screw (r).
(2) Detach the relay lens assembly.

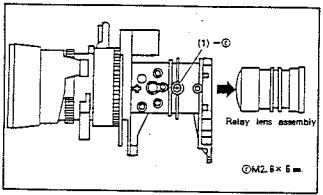


Fig. II-9

2-5 Removal of IG meter assembly

(1) Remove a screw (S).
(2) Detach the IG meter downward.

*Note: When detaching/attaching, be careful not to deform the diaphragm blades. As the diaphragm blades are likely to come off from the dowel, check that they are secured completely.

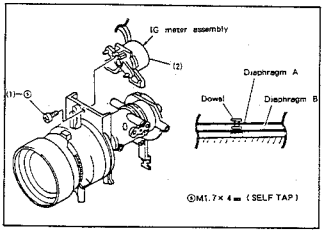


Fig. II-10

2-6 Removal of diaphragm blades A and B

(1) Remove the IG meter.
(2) Align the part (a) of diaphragm blade A with its dowel position, and then detach the diaphragm blade A.
(3) Also, detach the diaphragm blade B in the same manner.

* Notes: 1. Be extremely careful not to bend or contaminate the diaphragm blades. Also, do not touch them with bare hand or fingers.
2. The ND filter is in the blade A.

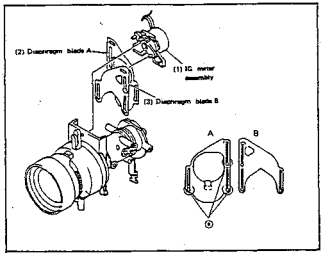


Fig. II-11

2-7 Removal of zoom sheet

(1) Peel off the zoom sheet with a pair of tweezers or the like.

* Note: When reattaching the zoom sheet, take care not to crease or kink it.

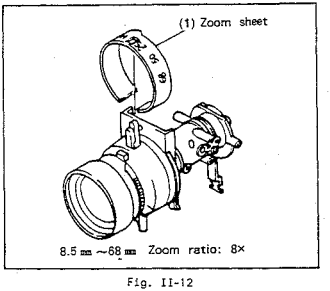


Fig. II-12

2-8 Separation of zoom section

(1) To detach the N stopper, remove a screw (t).
(2) Dismount the focus lens assembly.
(3) Remove three screws (U) with the relay holder (D) and the fixed lens barrel (A) connected.
(4) Turn the focus side up.
(5) Set the zoom ring to the telephoto-end position. Then, pull up the fixed lens barrel (A) straight gradually.

* Notes: 1. The cam ring (C) and the zoom ring (B) are detached when the fixed lens barrel (A) is pulled up straight.
2. The three guide bars and a spring are still installed into the relay holder (D) at this state.

(6) Align the depression of fixed lens barrel A and the projection of zoom lever (B) (inside). Then, pull up the fixed lens barrel (A) straight.
(7) Detach the projection of zoom ring (B) (inside) from the cam ring (C). Then, pull up the zoom ring (B) straight.
(8) Remove two screws (V).

* Note: When reassembling, check the size of screws.

(9) Pull up the cam ring (C) straight.

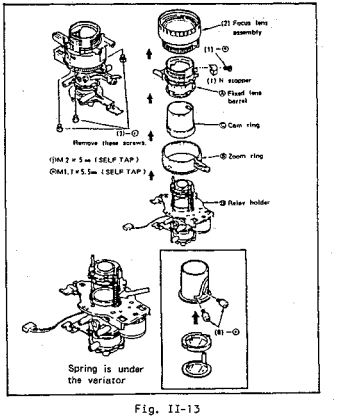


Fig. II-13

2-9 Reassembling of zoom ring

(1) Install a comensator lens (E) to a relay holder (D), and then a variator lens (F) to it.
(2) Put the cam ring on the relay holder. Then secure them with two screws (v).
* Note: Check that the plate springs are positioned properly.
(3) Install the zoom ring while engaging the claw of zoom ring with the cam ring.
(4) Mount the fixed lens barrel.
* Note: When mounting, set the zoom ring at the telephoto-end position. Also, set three zoom bars into the holes of fixed lens barrel completely.
(5) Secure the relay holder and the fixed lens barrel with three screws (u).
(6) Mount the focus lens assembly. Then, secure the N stopper with a screw (t).
(7) Perform the operational checks and the AF distance measuring adjustment.

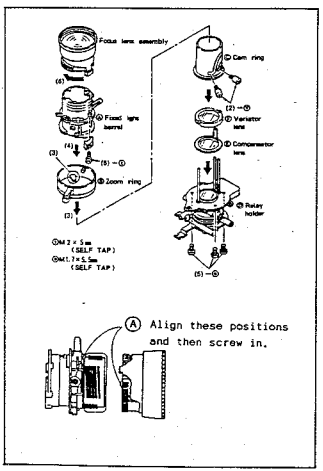


Fig. II-14

2-10 Oil/grease/bond application positions

After cleaning, replacement, etc., apply the followings to the indicted positions in the Fig. II-15.

(1) Grease GE-X8 (CY9-8044-000)
(2) Grease GE-C4 (CY9-8045-000)
(3) Instantaneous adhesive Alonalpha (CY9-8007-000)
(4) Floil G902 (DY9-3017-000)
(5) Use the above MP-102 with GE-C4.
Weight ratio is as follows.
MP-102 : GE-C4
3 : 10
Teflon Fluorocarbon Resin MP-102 (DY2-3013-000)
Grease GE-C4 (CY9-8045-000)

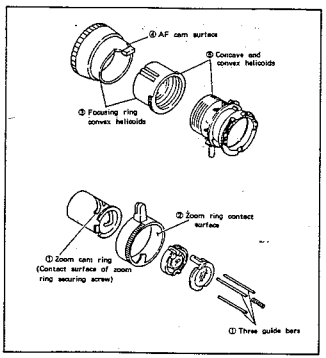

④ AF cam surface
③ Concave and convex helicoids
② Focusing ring convex helicoids
② Zoom ring contact surface
① Zoom cam ring (Contact surface of zoom ring securing screw)
① Three guide bars

Fig. II-15

2-4 Disassembling of recorder section

2-4-1 Removal of RECORDER-MAIN, RECORDER-KEY and REMOCON C.B.A.s

(1) Remove a screw (j).
(2) Unplug CN003 of RECORDER-KEY C.B.A.
(3) To detach the RECORDER-KEY C.B.A., open the C.B.A., and unplug CN001 and 002.

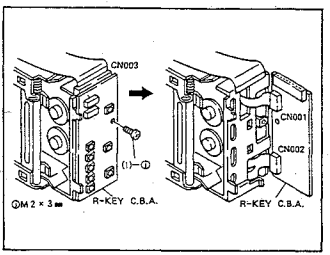


Fig. II-27

(4) Unplug connectors between the R.MAIN C.B.A. and the Recorder unit. (CN403, CN606, CN402, CN605, CN607)

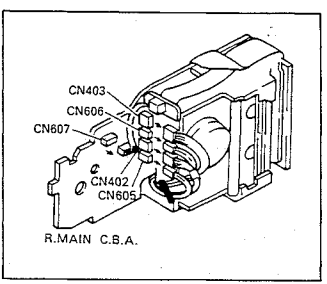


Fig. II-28

(5) To open the R.MAIN C.B.A., remove two screws (j).
(6) Unplug a connector between the R.MAIN C.B.A. and the Recorder unit. (CN301)
(7) To detach the REMOCON C.B.A., remove a screw (j).

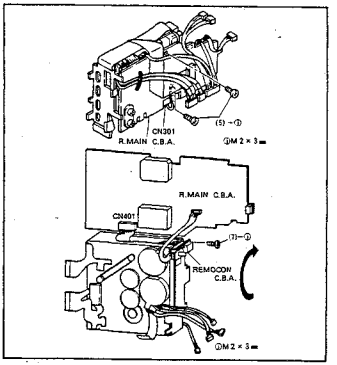


Fig. II-29

2-4-2 Removal of recorder holders A and B

(1) Unplug the capstan connector.
(2) Remove two screws (w), one screw (x) and two screws (j).
(3) Detach the recorder holders A and B.

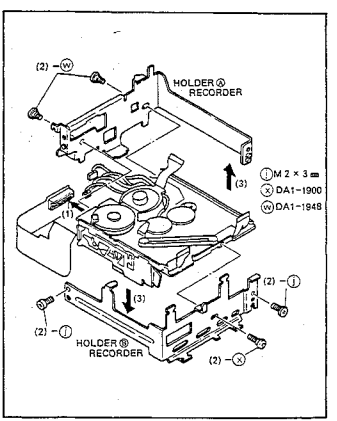


Fig. II-30

2-5 Wirings

(1) RECORDER-MAIN C.B.A.

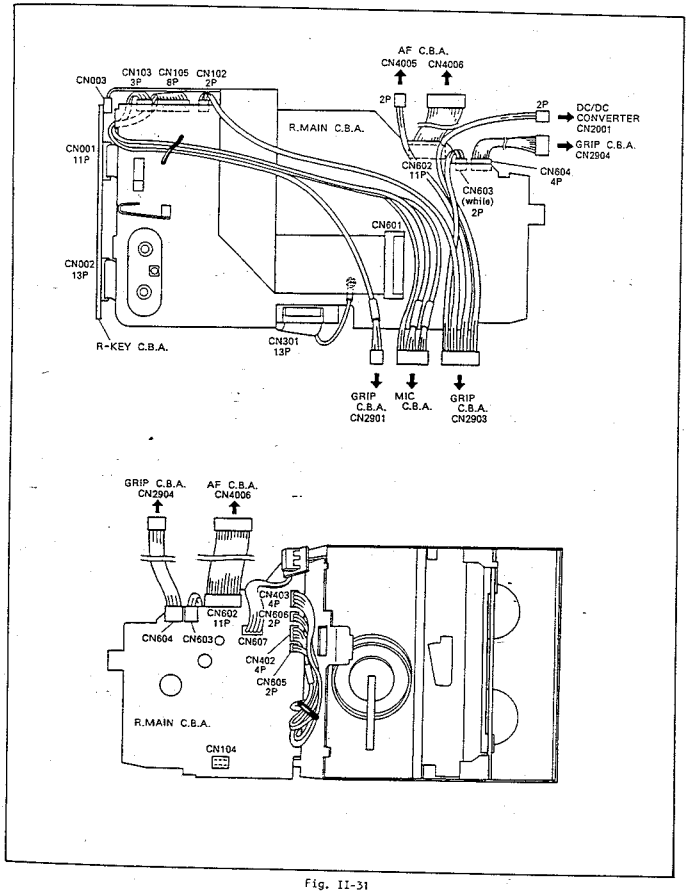


Fig. II-31

(2) GRIP C.B.A.

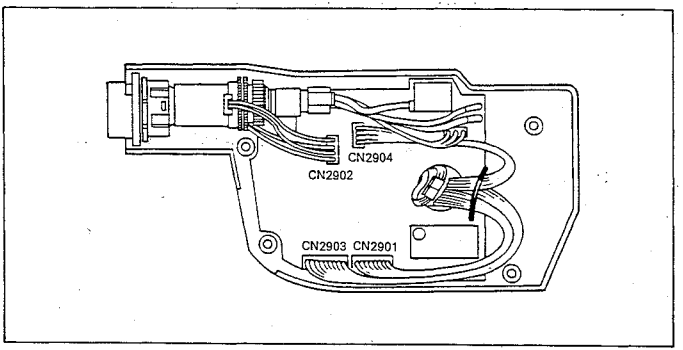


Fig. II-32

3. Before Adjusting

3-1 Preparation for camera section adjustments

3-1-1 Setting

* Preparation

  * Y/C mix amplifier (DY9-1079-000)
  * Extension connector kit (DY9-1102-000)
  * Constant voltage supplier (6 V)

- For camera electrical adjustment -

Procedures:

(1) Connect a Y/C Mix Amplifier by using extension connectors a and b.

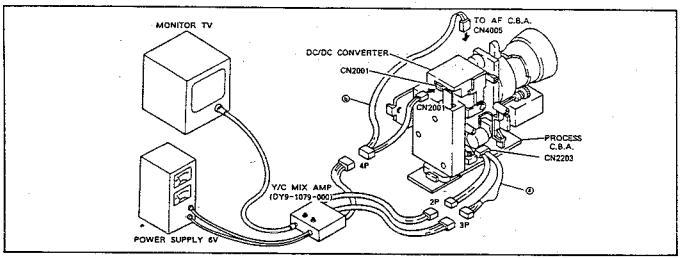


Fig. II-33

(2) Preparation for camera adjustment (setting of charts/unit)

1) Detach the camera holder (2).

2) Set the camera unit in front of the chart with both the unit and the chart upside down.

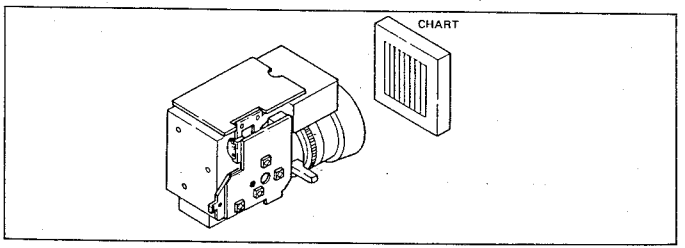


Fig. II-34

(3) AF check (camera unit only)

- Short-circuit the followings on the AF C.B.A. to check the AF function by using a camera unit independently.

  CN4005 1 pin (UNREG 6V) ⟷ CN4006 1 pin (CAMERA ON(H))

  2 pin (GND) ⟷ 2 pin (AF ON(L))

3-1-2 How to open C.B.A.s of camera section

Procedures:

(1) Remove two screws securing the camera holder 2.
(2) Detach the camera holder 2, and disconnect the PROCESS C.B.A.
(3) Connect the PROCESS C.B.A. and the SENSOR C.B.A. with an extension connector c.

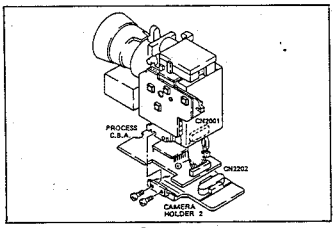


Fig. II-35

3-1-3 Chart for adjustment

(1) Fixture (attached to Service Manual for A1A)

Used for the blooming adjustment. Set the fixture onto the front face of lens, and attach each filter.

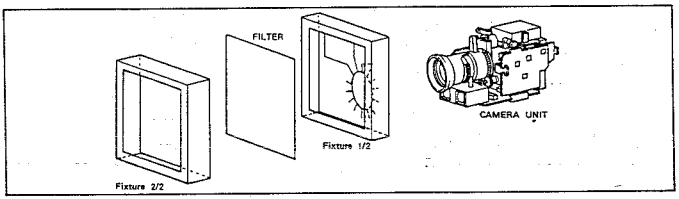


Fig. II-36

(2) U-chart

1) Prepare by cutting a U-pattern off from the center of black paper. Size is detailed in the Fig. II-37.
2) ⧖ marks indicate the standard picture frame.

* Note: For the blooming adjustment, attach a piece of white paper onto the rear side.

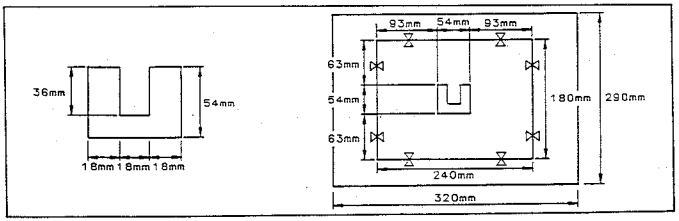


Fig. II-37

3-1-4 Other precautions

(1) Prior to adjustment, energize the equipment for 3 minutes or longer.

(2) Set the light box at color temperature 5600°K.

(3) "Standard angle of view"

- The "standard angle of view" is given when the charts displayed so as to meet the maximum screen of the full scan monitor.
- With an oscilloscope, adjust the grayscale (36 μs) and the color bar (52 μs), followed by shooting.
- Shoot the white chart at its center.
- Unless otherwise specified, shooting distance must be about 1.4 m.

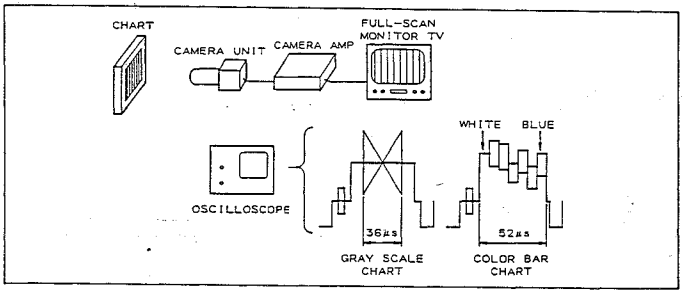


Fig. II-38

3-2 Preparation for recorder section adjustments

3-2-1 Settings

* Preparation

  * Input connector e (Extension connector kit, DY9-1102-000)
  * Constant voltage supplier (6 V)

* Note: Use a wireless remote controller (WL-400) to change the mode of recorder section because the recorder operation buttons are on the AF C.B.A.

1) - For recorder section adjustment I (setting for character display) -

Procedure:

(1) Connect each prepared devices as illustrated in the Fig. II-39.

* Notes: 1. In case that the character display (monitor TV) is not necessary, refer to "For recorder section adjustment II" below.
2. To check the AUDIO system, plug the microphone.

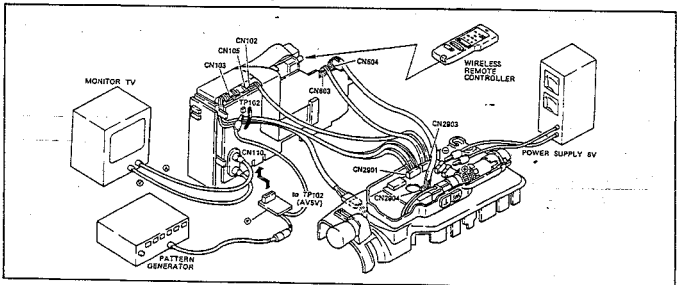


Fig. II-39

2) - For recorder section adjustment II -
(for adjustments without character display)

Procedure:

(1) Connect each prepared devices as illustrated in the Fig. II-40.

* Notes: 1. This setting does not require the GRIP C.B.A.
2. As the character generator is connected with the GRIP C.B.A., character is not displayed by this setting.
3. As the VR for the battery voltage dropout adjustment is on the GRIP C.B.A., supply a voltage to pin 4 of CN604 (R.MAIN C.B.A.) with an extension connector d.

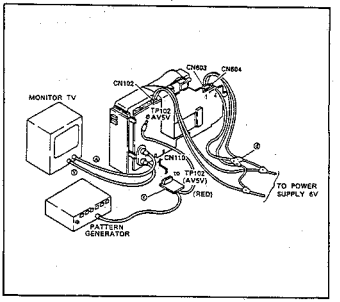


Fig. II-40

3) - For tape transport adjustment -

Procedures:

(1) Set up the state explained in the 1 or 2 "- For the recorder adjustment I or II -".

(2) By using an input connector e, pick up GND, PB-RF and SWP signals for each adjustment.

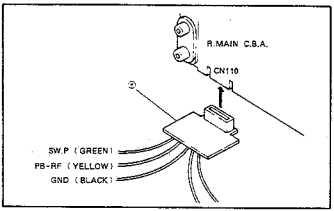


Fig. II-41

3-2-2 How to open C.B.A.s of recorder section

1) R-KEY C.B.A.

Procedure:

(1) Open the R-KEY C.B.A. with extension connectors K, L, N and O.

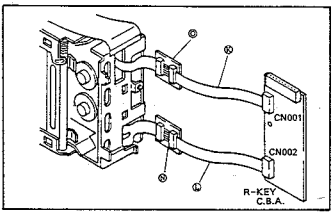


Fig. II-42

2) R.MAIN C.B.A.

Procedures:

(1) Remove two screws securing the R.MAIN C.B.A. and CN301.

(2) Remove a screw securing the REMOCON C.B.A.
Take out the C.B.A. from the recorder unit.

(3) Connect CN003 and the R-KEY C.B.A. Then, open the C.B.A. with the following connectors.
K: T-reel extension cable (11p)
L: S-reel extension cable (13p)
M: Drum extension cable (13p)
N: L, M connector
O: K connector

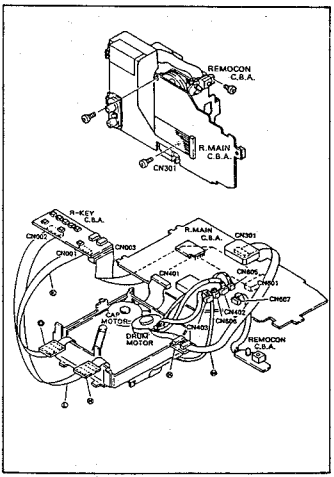


Fig. II-43

3-2-3 Service modes

Service modes are provided for adjustments/operation checks. Activate each mode with the recorder and the EVF connected for the purpose of character display.

(1) Transition to service modes

Mode is switched over when the pattern of wireless remote controller (WL-100, WL-200, WL-400) is shorted.

NORMAL → S-01 → S-02 → S-1 → S-2 → → NORMAL

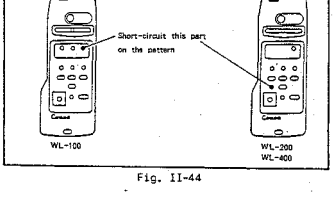


Fig. II-44

(3) Function of service mode

[S-01, S-02] (for tape transport adjustment) * Refer to the MC-4B Service Manual.

In this mode, no information character is displayed on EVF screen.
Instead, POWER LED lamp flashes at certain interval of seconds.

* S-01 100% tracking, 220° envelope output mode
  Power LED lamp flashes in every 1 sec.
* S-02 70% tracking, 220° envelope output mode
  Power LED lamp flashes in every 2 sec.

[S-1] (for electrical adjustment, A/D converter data)

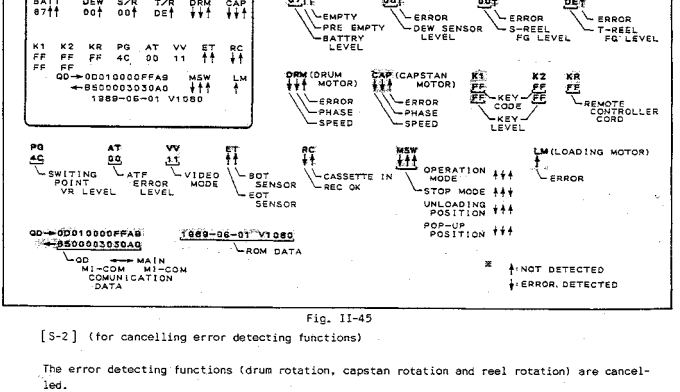


Fig. II-45

[S-2] (for cancelling error detecting functions)

The error detecting functions (drum rotation, capstan rotation and reel rotation) are cancelled.

4. Adjustments (Lens Section)

4-1 Back focus adjustment (T/W zoom correction)

CHART	Siemens chart located 3 m away
M. EQ.	Monitor TV
TOOL	Phillips screwdriver
ADJ.	Focusing ring, relay lens

* Note: Open the aperture fully as possible.

(1) Loosen the screw (a).
(2) With the telephoto-end zoom setting, bring the pattern image into focus by turning the focusing ring.
(3) With the wide angle end zoom setting, bring the pattern image into focus by moving the relay lens back and forth.
(4) Repeat the above steps (2) and (3) to remove defocusing at the telephoto and wide angle ends.
(5) Tighten the screw (a).
* Note: When tightening, be careful not to shift the relay lens from the correct position.
(6) Check the AF distance measuring function.

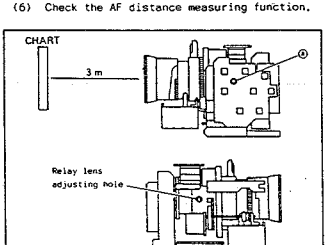


Fig. II-46

4-2 AF distance measurement adjustment

CHART	Siemens chart, 60% or higher reflectance chart.
M. EQ.	Monitor TV
TOOL	Hexagonal key wrench (1.27 mm), section paper, index strip
ADJ.	AF distance adjusting screw ((a))
SPEC.	+0.75 mm, -1.0 mm (+: Infinity side)

* Note: Open the aperture fully as possible.

(1) Attach the section paper and the index strip as shown in the Fig. II-47.
(2) Shoot the siemens chart from 3 m away.
(3) With the telephoto end setting, bring the chart image into best focus. Then, mark the relevant index position on the section paper.
(4) Replace the siemens chart with the 60% or higher reflectance chart.
(5) Mark the center AF stop position between the infinity and the closest ends on the section paper.
(6) Check a difference between the positions marked at the steps (3) and (5) is within the specified range.
(7) If not, adjust it by turning the hexagonal screw (a).

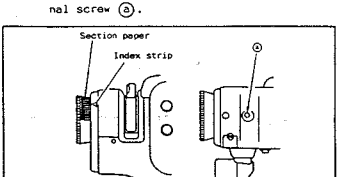


Fig. II-47

4-3 Preparation for lens focus adjustment

* Note: For this adjustment, pick up an actual scene at infinity (65 m or more away), or use a collimator.

Described below is the preparatory procedures by using the single-lens reflex camera and the lens (focal length: 300 mm or more recommended) in stead of a collimator.

CHART	Ground glass (30 mm x 40 mm, approx.)
TOOL	Single-lens reflex camera, lens (focal length: 200 mm or more), magnifier

(1) Open the aperture of single-lens reflex camera fully. Then, open the rear rid.
* Note: If the shutter equips the valve mechanism, lock it for opening the aperture. If not (e.g. Canon T series, etc.), open the aperture by using the slow shutter and take out the internal battery immediately while the shutter is opened.
(2) Secure the ground glass to the inside rail face by pressing it. At this step, the ground surface should face the lens side.
(3) Shoot a scene at infinity. To check if it is in best focus, enlarge the image on the ground glass by a magnifier.

* Note: Distance for infinity: See the Fig. II-48.

(4) After the above checking, remove the ground glass once and mark cross hairlines on it. Then, attach it to the camera again.

* Remark: Using this substitute collimator, the back focus adjustment (T/W zoom correction) can be performed with high accuracy within a short time.

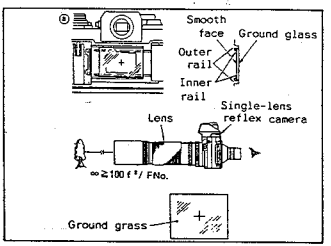


Fig. II-48

4-4 Lens focus adjustment

* Note: Perform this adjustment only when the focus lens assembly is replaced.

Described below is the adjustment procedures by using the single lens reflex camera instead of a collimator.

CHART	Ground glass (30 mm x 40 mm, approx.)
M. EQ.	Monitor TV
TOOL	Single-lens reflex camera, lens (focal length: 200 mm or more), phillips screwdriver
ADJ.	Focusing lens, relay lens
SPEC.	Within 1/3 of infinity mark (∞), (+0.5 mm)

(1) Engage the concave helicoid with the focusing ring.

(2) Remove the N stopper, and take out the focus lens assembly.

* Notes: 1. When reassembling, check the screwing-in starting position.
2. Do not exert undue force at screwing-in, or the thread may be damaged.
3. When reassembling, apply grease as specified.

(3) Align the axis of main unit with that of the single-lens reflex camera as accurately as possible (visual alignment).

(4) With the telephoto end zoom setting, adjust focus using the front lens. At this time, hold the focusing ring to the infinity (∞) stop position, and turn the concave helicoid until the best focus is obtained.

(5) Loosen a screw (a).

(6) Move the relay lens back and forth with the wide angle end to bring the image into best focus.

(7) Repeat the steps (4) and (6) until the object is into best focus both in wide and telephoto ends.

(8) Lock the relay lens and check that the object is in best focus.

(9) Confirm that the focusing ring is butted onto the stopper at infinity side. Then, fix the focusing ring and the concave helicoid with an instantaneous adhesives specified. (Aionalpha)

* Notes: 1. Do not apply the adhesive excessively and also be careful not to drop it onto the other positions except indicated. (esp. AF cam part (D))
2. Do not touch forcibly for five minutes after application.

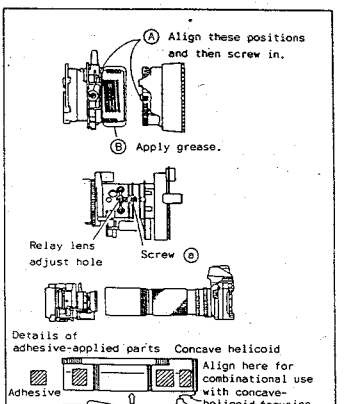

(A) Align these positions and then screw in.
(B) Apply grease.
Relay lens adjust hole
Screw (a)
Details of adhesive-applied parts
Concave helicoid
Align here for combinational use with concave-helicoid focusing ring.
Adhesive applied
Focus ring
(D) Never apply adhesive to this part.

Fig. II-49

5. Electrical Adjustments (Camera Section)

* Note: For the following adjustments from 5-3 to 5-10, set the AWB PRESET mode. To set it, connect each TP as follows.

TP2654(R-Y CONT)←→AWB C.B.A. 4P(+1.8V)
TP2655(B-Y CONT)←→AWB C.B.A. 4P(+1.8V)

5-1 Clock frequency adjustment

M. EQ.	Frequency counter *Connect via oscilloscope
TP/TRIG.	PRO. C.B.A. CN2202 (18 PIN), TP2653 (GND)
ADJ.	SENS C.B.A. VC2001 (CLOCK)
SPEC.	4.828125 MHz ± 0.000015 MHz

5-2 PLL adjustment

M. EQ.	Digital voltmeter
TP/TRIG.	TP2203 (PLL), TP2653 (GND)
ADJ.	SENS C.B.A. VC2202 (PLL)
SPEC.	2.5 ± 0.1 V

5-3 Auto iris adjustment

* Note: After adjustment, move iris from lens-closed to opened to confirm the specification obtained.

CHART	Grayscale (5600°K)
MODE	AWB PRESET
M. EQ.	Oscilloscope
TP/TRIG.	TP2202 (Y IRIS), TP2204 (FH/2)
ADJ.	PRO C.B.A. VR2201 (IRIS)
SPEC.	300 ± 10 mV

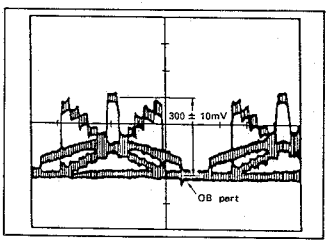


Fig. II-50 10 mV/10 µs

5-4 OB set adjustment

CHART	Lens closed
MODE	AWB PRESET
M. EQ.	Oscilloscope
TP/TRIG.	TP2205 (Y AGC), TP2204 (FH/2)
ADJ.	PRO. C.B.A. VR2202 (OB SET)
SPEC.	Levels of waveform and blanking centers to be the same.

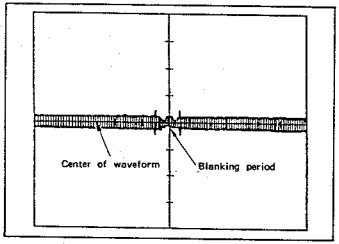


Fig. II-51 5 mV/10 µs

5-5 Y level adjustment

* Note: Before adjustment, short-circuit TP2403 (W.CLIP) and TP2652 (+5V). Use the waveform having higher center peak.

CHART	Grayscale (5600°K)
MODE	AWB PRESET, TP2403 ←→ TP2652
M. EQ.	Oscilloscope
TP/TRIG.	TP2405 (Y OUT), TP2204 (FH/2)
ADJ.	VR2203 (AGC LEVEL)
SPEC.	1000 ± 20 mV

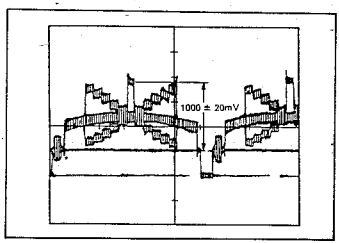


Fig. II-52 50 mV/10 µs

5-6 1/2 fH color difference elimination

CHART	LENS CLOSED
MODE	AWB PRESET
M. EQ.	Oscilloscope
TP/TRIG.	CN2202 pin 21 (C. OH), TP2204 (FH/2)
ADJ.	VR2204 (FH/2 COMP)
SPEC.	0 ± 10 mV

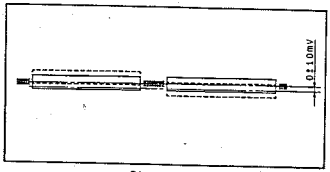


Fig. II-53 5 mV/10 μs

5-7 Color difference Gain/Modulation axis adjustments

CHART	Color bar (5600°K)
MODE	AWB PRESET
M. EQ.	Vectorscope
ADJ.	PRO CBA VR2207 (C1H LEVEL) PRO CBA VR2405 (BRUST ϕ) PRO CBA VC2401 (SC 90)
SPEC.	* Overlay each bright dot Acceptable dot split: Phase 5° or less Gain 10% or less * Burst phase: 135 ± 2°

Notes:
1. Measure dot split according to Fig. II-54.
2. Adjust R, Ye and G mainly.
3. Both of two specification value (dot split/burst phase) must be obtained at the same time.

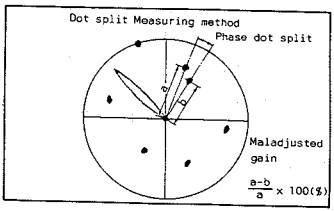


Fig. II-54

5-8 Carrier balance adjustment

CHART	Grayscale (see Fig. II-55) (5600°)
MODE	AWB PRESET
M. EQ.	Vectorscope
ADJ.	VR2403 (B-Y CB) VR2404 (R-Y CB)
SPEC.	Bright dot (dark part)to be centered

* Notes:
1. Turn a zoom setting from the standard angle of view to a wide angle for the adjustment.
2. If two dots are appeared, choose a dot in the dark part.

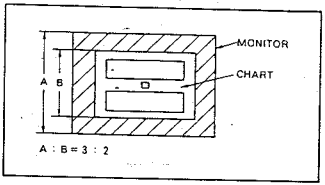


Fig. II-55

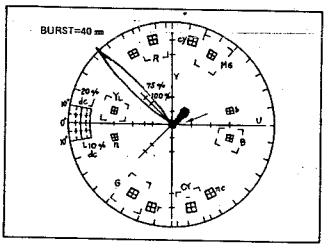


Fig. II-56

5-9 White balance adjustment

CHART	Grayscale
MODE	AWB PRESET
M. EQ.	Vectorscope
ADJ.	VR2205 (R WB), VR2206 (B WB)
SPEC.	Set bright dot at the center as possible.

5-10 Color balance adjustment

* Note: Adjust R's phase and gain mainly.

CHART	Color bar		
MODE	AWB PRESET		
M. EQ.	Vectorscope		
ADJ.	VR2401 (B GAIN), VR2402 (R GAIN)		
SPEC.		Color panse	Gain (burst ratio)
	R	102 ± 4°	1.5 ± 0.1 times
	Ye	166 ± 6°	1.0 ± 0.2 times
	G	242 ± 10°	-

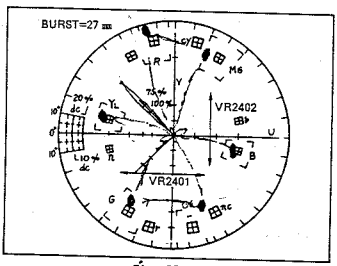


Fig. II-57

5-11 Full auto white balance adjustments 1 and 2

CHART	White chart
M. EQ.	Vectorscope
TOOL	Halogen lamp

* Full auto white balance adjustment 1

MODE	FAWB R-Y CH PRO. C.B.A.	
	TP2656 (CH SEL)	TP2653 (GND)
	TP2651 (FL TEST)	TP2653 (GND)
ADJ.	VR2651 (AWB R-Y) VR2653 (AWB B-B)	
SPEC.	Set bright dot to position as shown in Fig. II-58.	

* Full auto white balance adjustment 2

MODE	FAWB B-Y CH PRO. C.B.A.	
	TP2656 (CH SEL)	TP2652 (+5V)
	TP2651 (FL TEST)	TP2653 (GND)
ADJ.	VR2652 (AWB B-Y)	
SPEC.	Set bright dot to position as shown in the Fig. II-58.	

* Note: Turn VR gradually.

Procedures:

(1) Shoot white chart with halogen lamp lighted.

(2) Set each bright dots as in Fig. II-58, respectively.

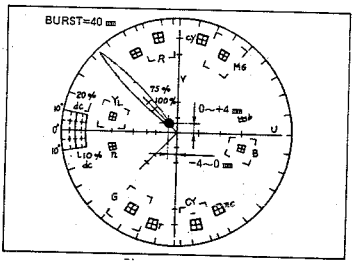


Fig. II-58

5-12 Full auto white balance adjustment 3

CHART	White chart	
M. EQ.	Vectorscope	
TOOL	Halogem lamp	
MODE	FAWB R+B	
	PRO. C.B.A.	
	TP2656 (CH SEL)	TP2653 (GND)
	TP2651 (FL TEST)	Open
ADJ.	VR2654 (AWB R+B)	

* Note: Do not turn VR excessively.

Procedures:

(1) Shoot white chart with halogen lamp lighted.
(2) Shift bright dot in direction of B-Y +. (VR2654)
(3) Turn VR2654 reversely to above direction until bright dot comes to the position in Fig. II-59.

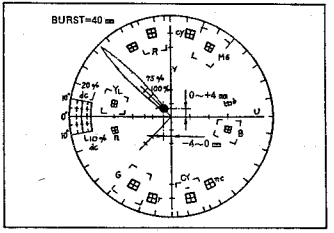


Fig. II-59

5-13 Blooming adjustment

CHART	U-pattern chart (with white paper)
MODE	Iris opened
	TP2201 (IRIS O/C) TP2652 (5 V)
M. EQ.	Oscilloscope
TOOL	ND-2.0 filter (DY9-2044-000)
	Halogen lamp, White paper (thin one),
	Fixture (supplement for A1E,F's Service Manual)
TP/TRIG.	PRO. C.B.A. TP2202 (S/H OUT)
	TP2204 (FH/2)
ADJ.	SENS. C.B.A. VR2101 (V SUB)
SPEC.	TYPE I Suppress blooming
	TYPE II 1000 mVp-p

* Note: Perform this adjustment only when the CCD is replaced.
Before the SENSOR C.B.A. is replaced, measure the voltage at pin 14 of CCD (V SUB) in advance.
After mounting the new C.B.A., adjust the VR2101 to make the pin voltage same as that measured in advance.

Procedures:

(1) Open the iris. (TP2201 ⟷ TP2652)
(2) Attach the ND-2.0 filter on the front face of lens with the fixture. (supplement for A1E,F's Service Manual)
(3) Prepare a U-pattern chart with a white paper attached on its rear side.
(4) Make setting as shown in the Fig. II-60.
(5) Shoot the U-pattern chart with up side down. (Standard angle of view)
(6) Locate the halogen lamp so that the signal level at TP2202 becomes 300 mVp-p ("A" in the figure).
Also, adjust the angle of halogen light so that the waveform in the Fig. II-61 is obtained.
(7) Remove the ND-2.0 filter and observe the monitor TV. (Fig. II-62)
(8) Adjust VR2101 to check if the blooming is appeared.
Adjust the signal level at TP2202 to 1100 mVp-p ("a" in the figure) by VR2101.

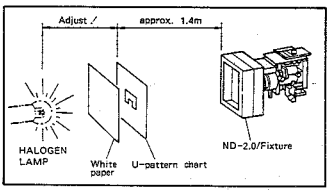


Fig. II-60

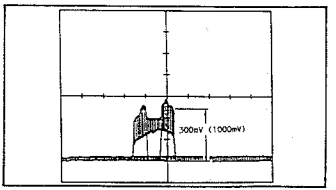
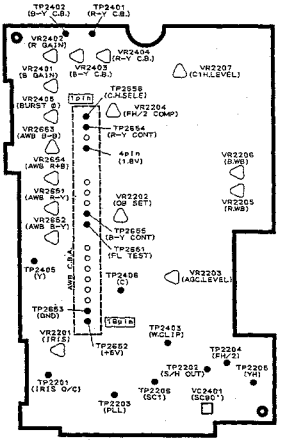


Fig. II-61 10 mV/10 µs

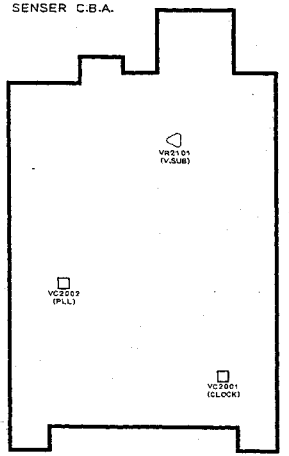
Locations of TP/VR/VC

PROCESS C.B.A.



TP	2201	IRIS O/S	VR	2201	IRIS
	2202	S/H OUT		2202	OB SET
	2203	PLL		2203	AGC. LEVEL
	2204	FH/2		2204	FH/2 COMP
	2205	YH		2205	R.WB
	2026	SC1		2206	B.WB
	2401	R-Y C.B.		2207	C1H LEVEL
	2402	B-Y C.B.		2401	B GAIN
	2403	W.CLIP		2402	R GAIN
	2405	Y		2403	B-Y C.B.
	2406	C		2404	R-Y C.B.
	2651	FL TEST		2405	BURST Ø
	2652	+5V		2651	AWB R-Y
	2653	GND		2652	AWB B-Y
	2654	R-Y CONT		2653	AWB B-B
	2655	B-Y CONT		2654	AWB R+B
	2656	C.H.SELE	VC	2401	SC90°
AWB C.B.A. 4 pin 1.8V					

SENSER C.B.A.



VR	2101	V.SUB
VC	2001	CLOCK
	2002	PLL

6. Electrical Adjustments (Recorder Section)

* Notes: 1. Before the following adjustments perform the input adjustment.

Procedures:

(1) Connect an input connector to make the recorder section adjustment setting. (Refer to the Fig. II-39.)
(2) Set the pattern generator at white 100% state.
(3) Adjust the output level of pattern generator to 0.49 Vp-p (TP109, R.MAIN C.B.A.)

* Notes: 2. REC or EE: CAMERA MODE
PB : RECORDER MODE

6-1 SS5V adjustment

MODE	EE
M. EQ.	Digital voltmeter
TP/TRIG.	R.MAIN C.B.A. TP601 (SS 5V)
ADJ.	R.MAIN C.B.A. VR603 (SS 5V)
SPEC.	5.1 ± 0.05 V

6-2 Undercut adjustment

MODE	REC
M. EQ.	Digital voltmeter, Monitor TV.
ADJ.	GRIP C.B.A. VR2961 (BATT)
SPEC.	BATT = 80 ± 01H/5.65 +0.1 -0.05 V

Procedures:

(1) Set a power sopurce voltage at 5.65 V.
(2) Set the SERVICE MODE [S-1] with a wireless remote controller.
(3) Turn VR until the spec. obtained.

6-3 ATF bias adjustment

SIGNAL	Color bar signal
MODE	REC PAUSE
M. EQ.	Monitor TV
ADJ.	R.MAIN C.B.A. VR401 (ATF)
SPEC.	ATF = 80 ± 03 H

Proceudres:

(1) Short-circuit TP402 (16K) and TP403 (47K) of SS C.B.A. by using a capacitor. (Use a capacitor approx. 10 μF/10 V.)
(2) Set the SERVICE MODE [S-1] with a wireless remote controller.
(3) To set the REC PAUSE MODE, change the RECORDER mode to the CAMERA mode.
(4) Turn VR until the spec. obtained.

6-4 Switching point adjustment

SIGNAL	Monoscope master (DY9-1062-000)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. CN110-13PIN (HSW), VIDEO OUT
ADJ.	R.MAIN C.B.A. VR602 (PG)
SPEC.	7 ± 1 H

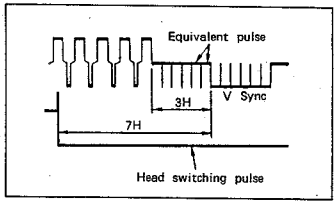


Fig. II-62

6-5 AV5V adjustment

MODE	EE
M. EQ.	Digital voltmeter
TP/TRIG.	R.MAIN C.B.A. TP102 (AV5V)
ADJ.	R.MAIN C.B.A. VR101 (AV5V)
SPEC.	5.1 ± 0.05 V

6-6 VIDEO LEVEL adjustment

SIGNAL	100% white video signal
MODE	EE
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. TP110 (Y)
ADJ.	R.MAIN C.B.A. VR112 (Y LEVEL)
SPEC.	0.5 ± 0.05 Vp-p

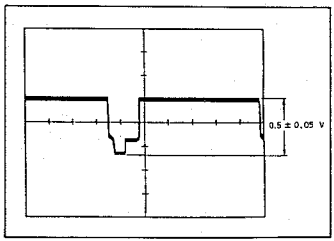


Fig. II-63 20 mV/10 μs

6-7 YC separation adjustment

SIGNAL	Color bar signal
MODE	EE
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. TP107 (EMPHASIS)
ADJ.	R.MAIN C.B.A. VR107 (Y/C SEP)
SPEC.	Minimize chrominance component as possible.

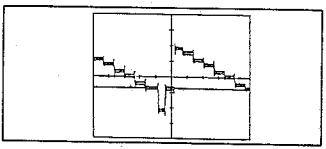


Fig. II-64 20 mV/10 µs

6-8 Y FM carrier adjustment

SIGNAL	Black (Cut R.G. and B with raster.)
MODE	REC (SP)
M. EQ.	Oscilloscope
TP/TRIG.	TP106 (Y FM)
ADJ.	VR109 (Y CAR.)
SPEC.	0.24 µsec./1 cycle (4.2 MHz approx.)

Fig. II-65 10 mV/50 ns

* Note: Use the signal waveform having longer cycle.

6-9 Y FM deviation adjustment

* Note: Use the signal waveform having the shortest cycle.

SIGNAL	100% white video signal
MODE	EE
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. TP106 (Y FM)
ADJ.	R.MAIN C.B.A. VR108 (Y DEV)
SPEC.	0.37 µsec./2 cycle (5.4 MHz approx.)

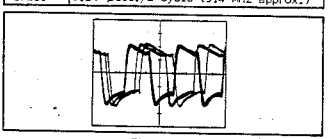


Fig. II-66 10 mV/50 ns

6-10 FM audio carrier adjustment

SIGNAL	No signal (Terminal-opened)
MODE	EE
M. EQ.	Oscilloscope, Frequency counter
TP/TRIG.	R.MAIN C.B.A. TP103 (A FM)
ADJ.	R.MAIN C.B.A. VR104 (A CAR)
SPEC.	1.5 ± 0.02 MHz

6-11 FM audio deviation adjustment

SIGNAL	D.O. Adj. Master (DY9-1064-000)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. PIN JACK (AUDIO OUT)
ADJ.	R.MAIN C.B.A. VR103 (A DEV)
SPEC.	890 ± 50 mVp-p

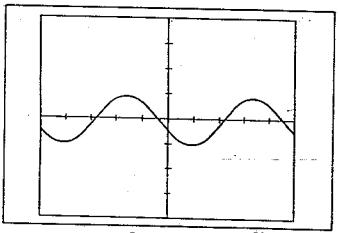


Fig. II-67 50 mV/0.5 ms

6-12 Recording current adjustment

(1) Luminance signal

SIGNAL	No signal (terminal-opened)
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	HA C.B.A. TP220 (REC CURR)
ADJ.	R.MAIN C.B.A. VR106 (REC Y)
SPEC.	300 ± 10 mVp-p

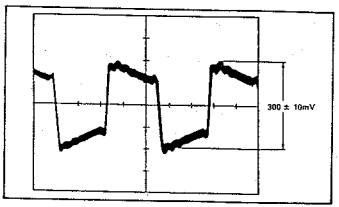


Fig. II-68 10 mV/50 ns

(2) Chrominance/Audio/ATF signals

* Note: To connect TP220 with a recording current checker, use a probe (1:1).

MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	HA C.B.A. TP220 (REC CURR)
TOOL	Recording current checker (DY9-1056-000)

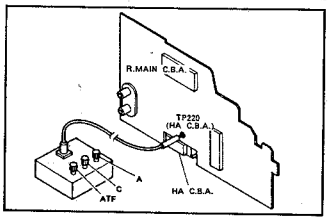


Fig. II-69

Chrominance

SIGNAL	RED raster signal
ADJ.	R.MAIN C.B.A. VR102 (REC C)
SPEC.	2.3 ± 0.1 Vp-p

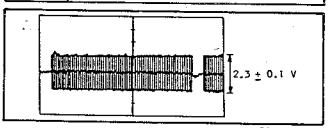


Fig. II-70 50 mV/2 ms

Audio

SIGNAL	Red raster signal
ADJ.	R.MAIN C.B.A. VR105 (REC APM)
SPEC.	1.5 V ± 0.1 Vp-p

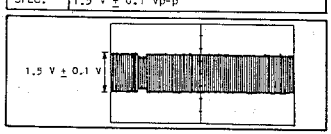


Fig. II-71 50 mV/2 ms

ATF

SIGNAL	Red raster signal
ADJ.	R.MAIN C.B.A. VR111 (REC 4f)
SPEC.	DC 0.7 ± 0.1 V

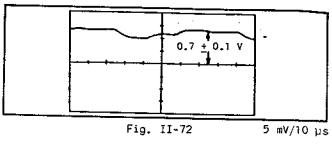


Fig. II-72 5 mV/10 µs

6-13 Playback Y level adjustment

SIGNAL	100% white video signal
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	R.MAIN C.B.A. TP108 (PB VIDEO)
ADJ.	R.MAIN C.B.A. VR110 (PB Y)
SPEC.	0.46 ± 0.02 V

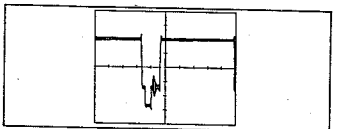


Fig. II-73 10 mV/10 µs

6-14 Character position of character generator adjustment

* Note: Make characters display with a wireless remote controller.

SIGNAL	Color bar
MODE	EE
M. EQ.	Monitor TV
TP/TRIG.	GRIP C.B.A. VC2941 (CG SIZE)
SPEC.	Lowermost digit of counter located in the middle of blue and black color bars

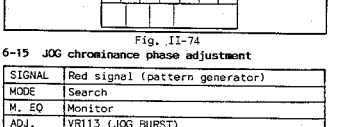


Fig. II-74

6-15 JOG chrominance phase adjustment

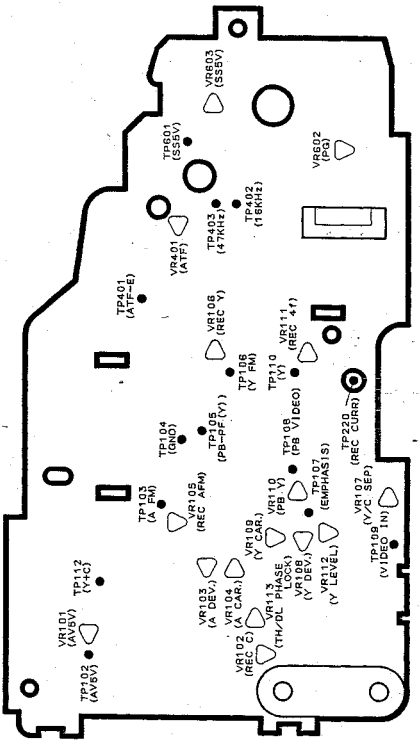
SIGNAL	Red signal (pattern generator)
MODE	Search
M. EQ	Monitor
ADJ.	VR113 (JOG BURST)
SPEC.	Eliminate the block stripes

Procedures:

1) Record red signal in LP mode.
2) Playback and search the recorded part.
3) Eliminate the black stripes on the screen.

Locations of TP/VR/VC

RECORDER-MAIN C.B.A.



TP	102	AV5V
	103	A FM
	104	GND
	105	PB-RF(Y)
	106	Y FM
	107	EMPHASIS
	108	PB VIDEO
	109	VIDEO IN
	110	Y
	112	Y+C
	220	REC CURR
	401	ATF-E
	402	16KHz
	403	47KHz
	601	SS5V
VR	101	AV5V
	102	REC C
	103	A DEV.
	104	A CAR.
	105	REC AFM
	106	REC Y
	107	Y/C SEP
	108	Y DEV.
	109	Y CAR.
	110	PB Y
	111	REC 4f.
	112	Y LEVEL
	113	TH/DL PHASE LOCK
	401	ATF
	602	PG
	603	SS5V

7. EVF Adjustments

7-1 Free-run frequency adjustment

SIGNAL	No signal (Terminal-opened)
MODE	EE
M. EQ.	Oscilloscope, frequency counter
TP/TRIG.	GRIP C.B.A. TP2901 (HD)
ADJ.	GRIP C.B.A. VR2902 (H. PHASE)
SPEC.	15.90 ± 0.05 KHz

7-2 Vertical amplitude adjustment

SIGNAL	Monoscope master (DY9-1062-000)
MODE	PLAY
M. EQ.	EVF, Monitor TV
ADJ.	GRIP C.B.A. VR2901 (V-SIZE)
SPEC.	Circle on monoscope master free from distortion. Absence of incongruity in comparison with monitor TV screen

7-3 Rotation and centering adjustment

SIGNAL	Monoscope master (DY9-1062-000)
MODE	PLAY
M. EQ.	EVF
ADJ.	Deflection yoke, centering magnet
SPEC.	Screen is not tilted and is located right at the center.

Procedures:

(1) Loosen the fastening ring to enable the deflection yoke to be moved.

(2) Turn the deflection yoke to correct screen tilt.

* Note: Move the deflection yoke completely toward the CRT screen.

(3) Tighten the fastening ring.

* Note: The fastening ring must be tightened so that the centering magnet can still be moved.

(4) Adjust the centering magnet so as to locate the picture at the center.

(5) Tighten the fastening ring completely.

* Note: Pay attention not to overtighten the ring.

(6) Fix the centering magnet by applying paint or the like (in 180° direction, at 2 points.).

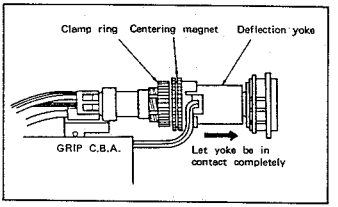


Fig. II-75

7-4 Brightness adjustment

SIGNAL	Self-record/playback tape (grayscale)
MODE	PLAY
M. EQ.	EVF
ADJ.	GRIP C.B.A. VR2904 (BRIGHT)
SPEC.	Distinguishable down to 11th step grayscale

7-5 Focus adjustment

MODE	Lens-capped (character display)
M. EQ.	EVF
ADJ.	GRIP C.B.A. VR2903 (FOCUS)
SPEC.	EVF character under optimum focus

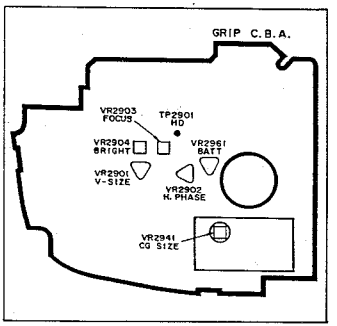


Fig. II-76

8. Mechanical Adjustment of Recorder Section

For mechanical adjustment of the recorder section, refer to the MC-4B service manual. The additional mechanical adjustment items only applied for E30A are explained here.

① Service mode (220° 70%)

Service mode (220° 70%) is set for tracking fine adjustment (3-2-3). However, sometimes the waveform does not match 70% RF envelope output. In such cases, turn the VR401 (on R.MAIN C.B.A.) until the waveform is adjusted to 70%.

* Note: After tracking fine adjustment, readjust the ATF bias (6-3) and return the VR401 to the original position.

② Tape transport adjustment

Perform the tape transport adjustment referring to the setting 3-2-1 (3) on page II-16.

CONTENTS

CHAPTER IV. DIAGRAMS

1. Interconnection Diagram ..... Ⅳ－1

2. Block Diagrams
2-1 Camera section ..... Ⅳ－2
2-2 Syscon-servo section ..... Ⅳ－3
2-3 Video section ..... Ⅳ－4

3. Circuit Board/Schematic Diagrams
3-1 SENSOR/GRIP C.B.A. ..... Ⅳ－5, 6
3-2 PROCESS C.B.A. ..... Ⅳ－7, 8
3-3 RECORDER MAIN C.B.A. (VIDEO SECTION) ..... Ⅳ－9, 10
3-4 RECORDER MAIN C.B.A. (SYSCON-SERVO SECTION) ..... Ⅳ－11, 12

Guide to diagrams

1. Color coding

(1) Signal lines in block diagrams

Camera section
- Red (———) : Y
- (－－－－) : C

Video section
- Red (———) : Recording
- (－－－－) : Playback

Syscon-servo section
- Red (—·—·—) : Drum servo signal
- (－－－－) : Capstan servo signal

(2) Voltage on circuit diagram
- Red : Recording
- Black : Playback

(3) Signal lines on circuit diagrams

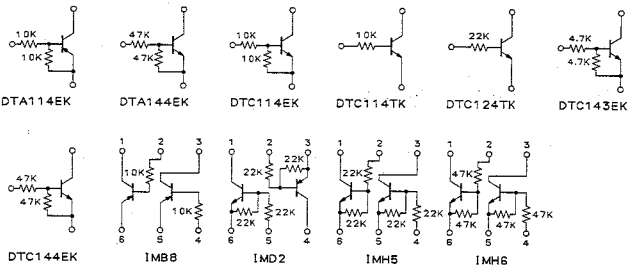
Camera section
- Red : Power supply line
- Blue : Luminance signal
- Orange : Chrominance signal
- Gray (▒▒▒▒) : Luminance + Chromiannce signals

Recorder section
- Blue (———) : Capstan PWM signal
- (－－－－) : Capstan ATF signal
- (—·—·—) : Capstan FG signal
- Orange (———) : Drum PWM signal
- (－－－－) : Drum FG signal
- (—·—·—) : Drum PG signal

Recorder section
- Gray (▒▒▒▒) : Recording luminance + Chrominance signals
- (▒▒▒▒) : Playback luminance + Chrominance signals
- Blue (———) : Recording luminance signal
- (－－－－) : Playback luminance signal
- Orange (———) : Recording chrominance signal
- (－－－－) : Playback chrominance signal
- Red (———) : Recording audio signal
- (－－－－) : Playback audio signal

(4) PC board layout
- Orange : Component side
- Netted black (▒▒▒▒) : Soldering side
- Black : Parts on component side
- Blue : Parts on soldering side

2. Equivalent circuits of digital transistor



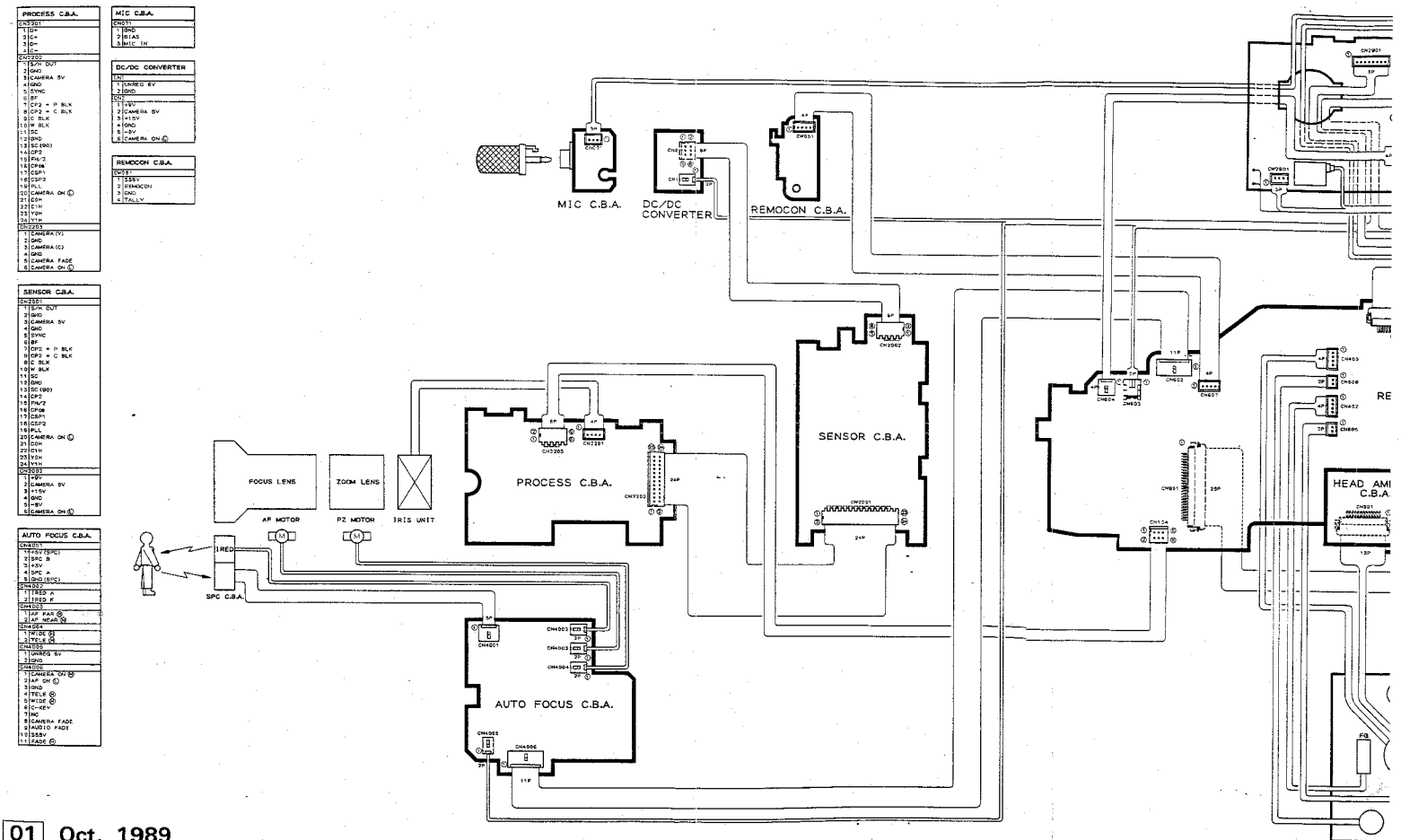
3. Indications on circuit diagram

- Resistance is represented in ohms (Ω).
- Capacitance is represented in farads (F).
- Voltages of capacitor are 25 V unless otherwise specified.
- Wattage of resistor is 1/16 W unless otherwise specified.
- Voltages are measured with a digital voltmeter.
- Waveform photographs are taken by using a 10:1 probe.
- IC No. in each C.B.A.s are listed on the bottom of diagrams.
- No. colored in blue are corresponded to the No. of waveform photographs.
- Voltage values indicated in circuit diagram are based on the following condition.

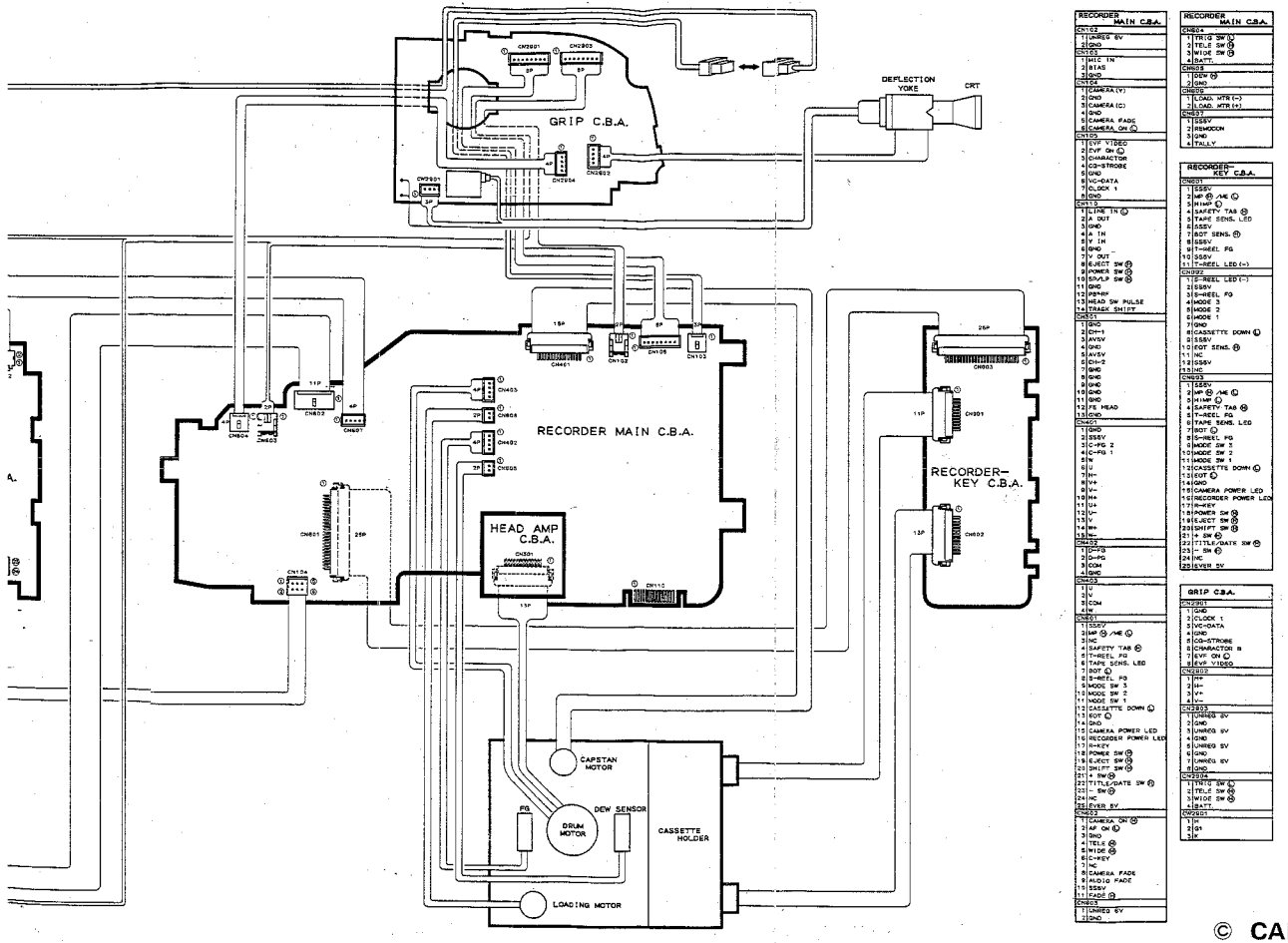
Camera section
Color bar, standard angle of view, AWB-preset

Recorder section
Recording : Color bar (pattern generator)
Playback : Self-recording Playback (Color bar)

INTERCONNECTION DIAGRAM



01 Oct. 1989



RECORDER MAIN C.B.A.

CN102
1 UNREG 6V
2 GND

CN101
1 MIC IN
2 BIAS
3 GND

CN104
1 CAMERA (Y)
2 GND
3 CAMERA (C)
4 GND
5 CAMERA FADE
6 CAMERA ON

CN105
1 EVF VIDEO
2 EVF ON
3 CHARACTOR
4 CG-STROBE
5 GND
6 VC-DATA
7 CLOCK 1
8 GND

CN103
1 LINE IN
2 A OUT
3 GND
4 A IN
5 V IN
6 GND
7 V OUT
8 EJECT SW
9 POWER SW
10 SV/LP SW
11 GND
12 PB*RF
13 HEAD SW PULSE
14 TRACK SHIFT

CN401
1 GND
2 CH-1
3 AVSV
4 GND
5 AVSV
6 CH-2
7 GND
8 GND
9 GND
10 GND
11 GND
12 FE HEAD
13 GND

CN402
1 GND
2 SSSV
3 C-PG 2
4 C-PG 1
5 W
6 U
7 W-
8 V+
9 V-
10 H+
11 U+
12 U-
13 V
14 W+
15 H-

CN403
1 D-PG
2 D-PG
3 COM
4 GND

CN404
1 U
2 V
3 COM
4 W

CN601
1 SSSV
2 MP Φ /ME
3 NC
4 SAFETY TAB
5 T-REEL PG
6 TAPE SENS. LED
7 EOT
8 S-REEL PG
9 MODE SW 3
10 MODE SW 2
11 MODE SW 1
12 CASSETTE DOWN
13 EOT
14 GND
15 CAMERA POWER LED
16 RECORDER POWER LED
17 R-KEY
18 POWER SW
19 EJECT SW
20 SHIFT SW
21 + SW
22 TITLE/DATE SW
23 - SW
24 NC
25 EVER 5V

CN602
1 CAMERA ON
2 AF ON
3 GND
4 TELE
5 WIDE
6 C-KEY
7 NC
8 CAMERA FADE
9 AUDIO FADE
10 SSSV
11 FADE

CN603
1 UNREG 6V
2 GND

RECORDER MAIN C.B.A.

CN604
1 TRIG SW
2 TELE SW
3 WIDE SW
4 BATT.

CN605
1 DEW
2 GND

CN606
1 LOAD. MTR (-)
2 LOAD. MTR (+)

CN607
1 SSSV
2 REMOCON
3 GND
4 TALLY

RECORDER-KEY C.B.A.

CN801
1 SSSV
2 MP Φ /ME
3 M-MP
4 SAFETY TAB
5 T-REEL PG
6 TAPE SENS. LED
7 EOT
8 S-REEL PG
9 MODE SW 3
10 MODE SW 2
11 MODE SW 1
12 CASSETTE DOWN
13 EOT
14 GND
15 CAMERA POWER LED
16 RECORDER POWER LED
17 R-KEY
18 POWER SW
19 EJECT SW
20 SHIFT SW
21 + SW
22 TITLE/DATE SW
23 - SW
24 NC
25 EVER 5V

CN802
1 S-REEL LED (-)
2 SSSV
3 S-REEL PG
4 MODE 3
5 MODE 2
6 MODE 1
7 GND
8 CASSETTE DOWN
9 SSSV
10 EOT SENS.
11 NC
12 SSSV
13 NC

CN803
1 SSSV
2 MP Φ /ME
3 M-MP
4 SAFETY TAB
5 T-REEL PG
6 TAPE SENS. LED
7 EOT
8 S-REEL PG
9 MODE SW 3
10 MODE SW 2
11 MODE SW 1
12 CASSETTE DOWN
13 EOT
14 GND
15 CAMERA POWER LED
16 RECORDER POWER LED
17 R-KEY
18 POWER SW
19 EJECT SW
20 SHIFT SW
21 + SW
22 TITLE/DATE SW
23 - SW
24 NC
25 EVER 5V

GRIP C.B.A.

CN2901
1 GND
2 CLOCK 1
3 VC-DATA
4 GND
5 CG-STROBE
6 CHARACTOR R
7 EVF ON
8 EVF VIDEO

CN2902
1 M+
2 M-
3 V+
4 V-

CN2903
1 UNREG 6V
2 GND
3 UNREG 6V
4 GND
5 UNREG 6V
6 GND
7 UNREG 6V
8 GND

CN2904
1 TRIG SW
2 TELE SW
3 WIDE SW
4 BATT.

CN2905
1 M
2 G1
3 P

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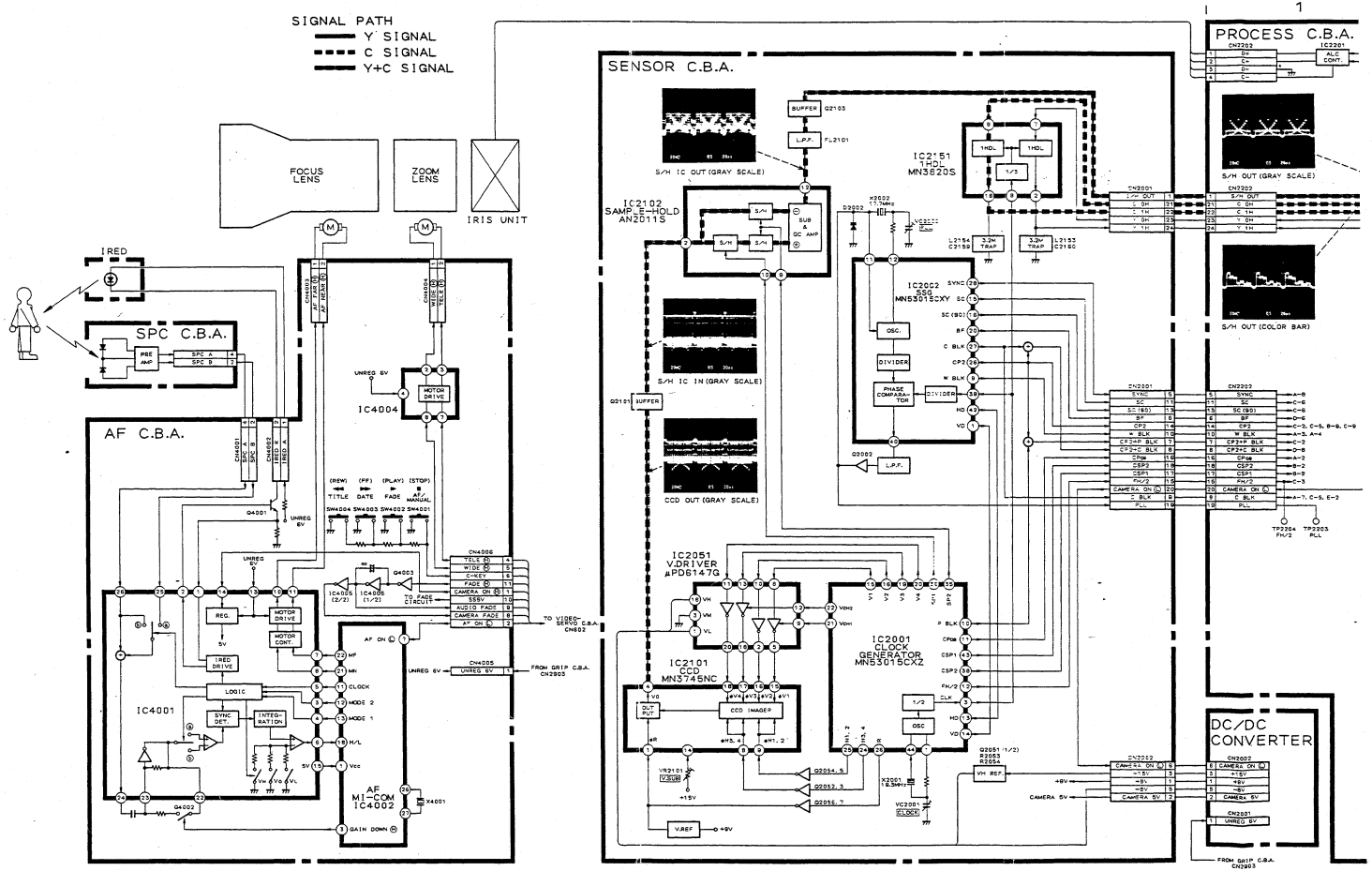
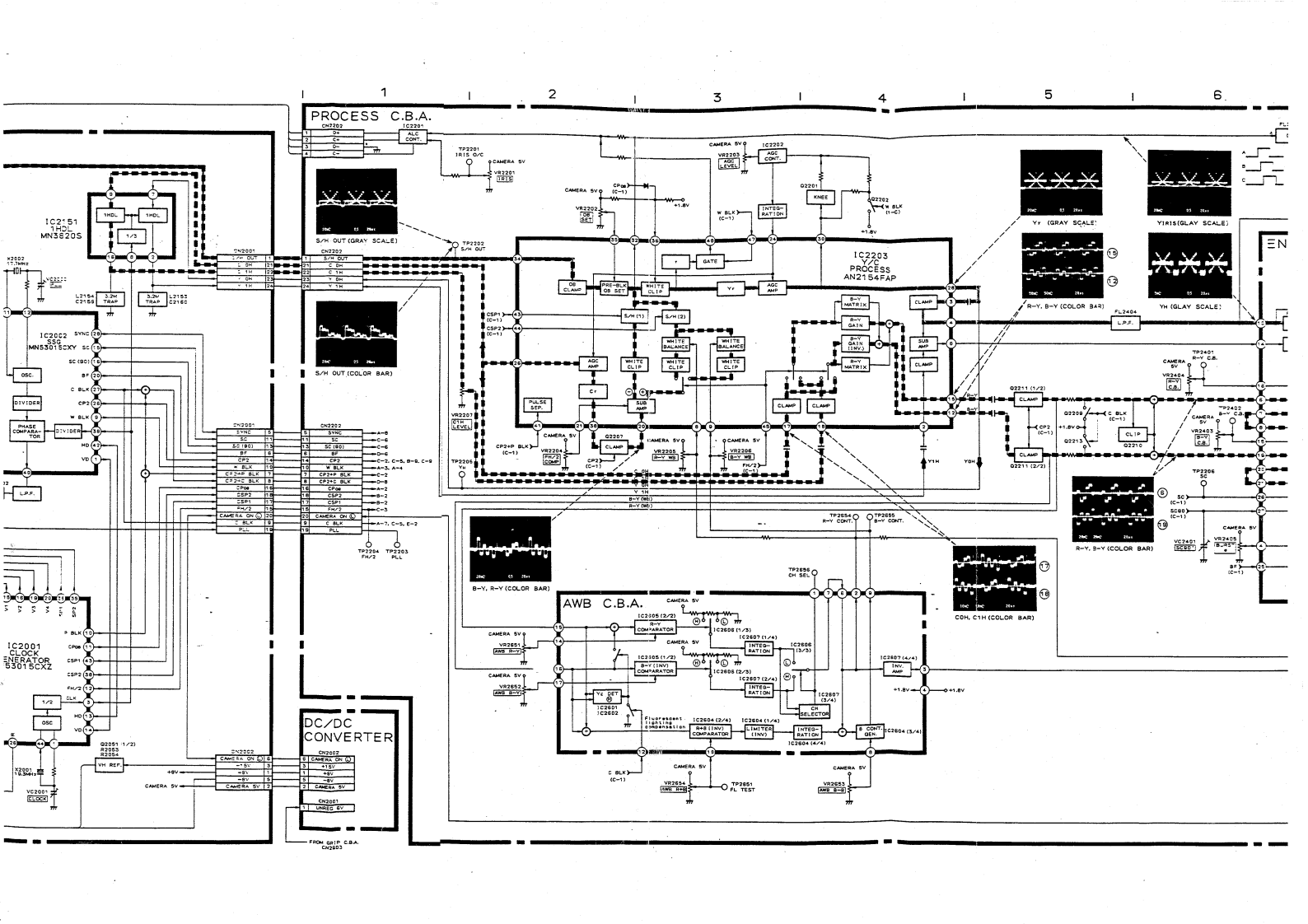
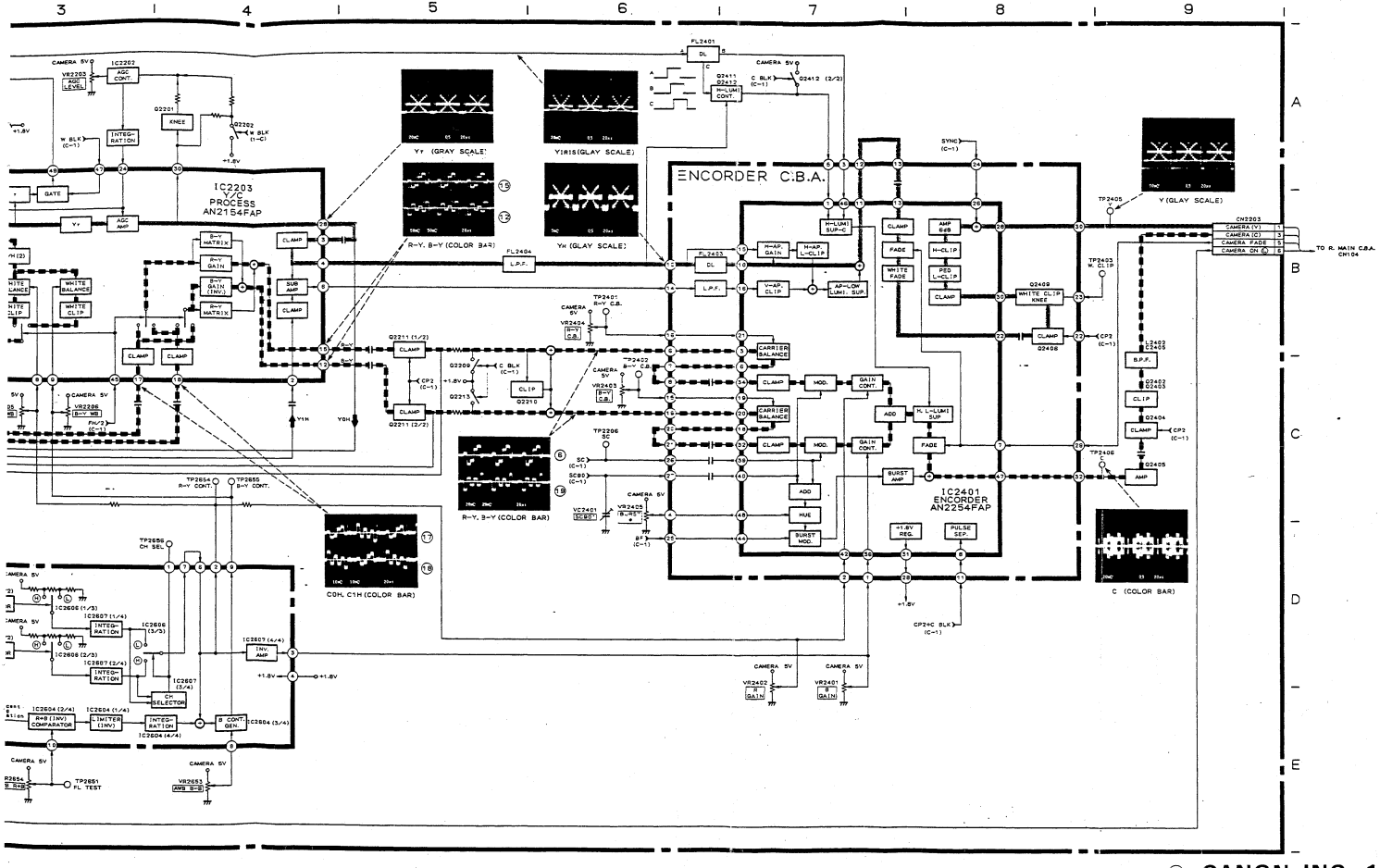
BLOCK DIAGRAM CAMERA SECTION




PROCESS C.B.A.
IC2151
1HD
MN3820S
IC2002
SSG
MN5301SCXY
IC2001
CLOCK
GENERATOR
5301SCXZ
IC2203
Y/C
PROCESS
AN2154FAP
AWB C.B.A.
DC/DC
CONVERTER
S/H OUT (GRAY SCALE)
S/H OUT (COLOR BAR)
Yy (GRAY SCALE)
Y1R1S(GLAY SCALE)
R-Y, B-Y (COLOR BAR)
Yh (GLAY SCALE)
B-Y, R-Y (COLOR BAR)
R-Y, B-Y (COLOR BAR)
C0H, C1H (COLOR BAR)
CN2001
CN2002
CN2003
ALC CONT.
AGC CONT.
KNEE
GATE
WHITE CLIP
WHITE BALANCE
CLAMP
SUB AMP
AGC AMP
PULSE SEP.
OSC.
DIVIDER
PHASE COMPARATOR
LPF
VH REF
UNREG 6V
FROM 6P I/P C.B.A. CN2803



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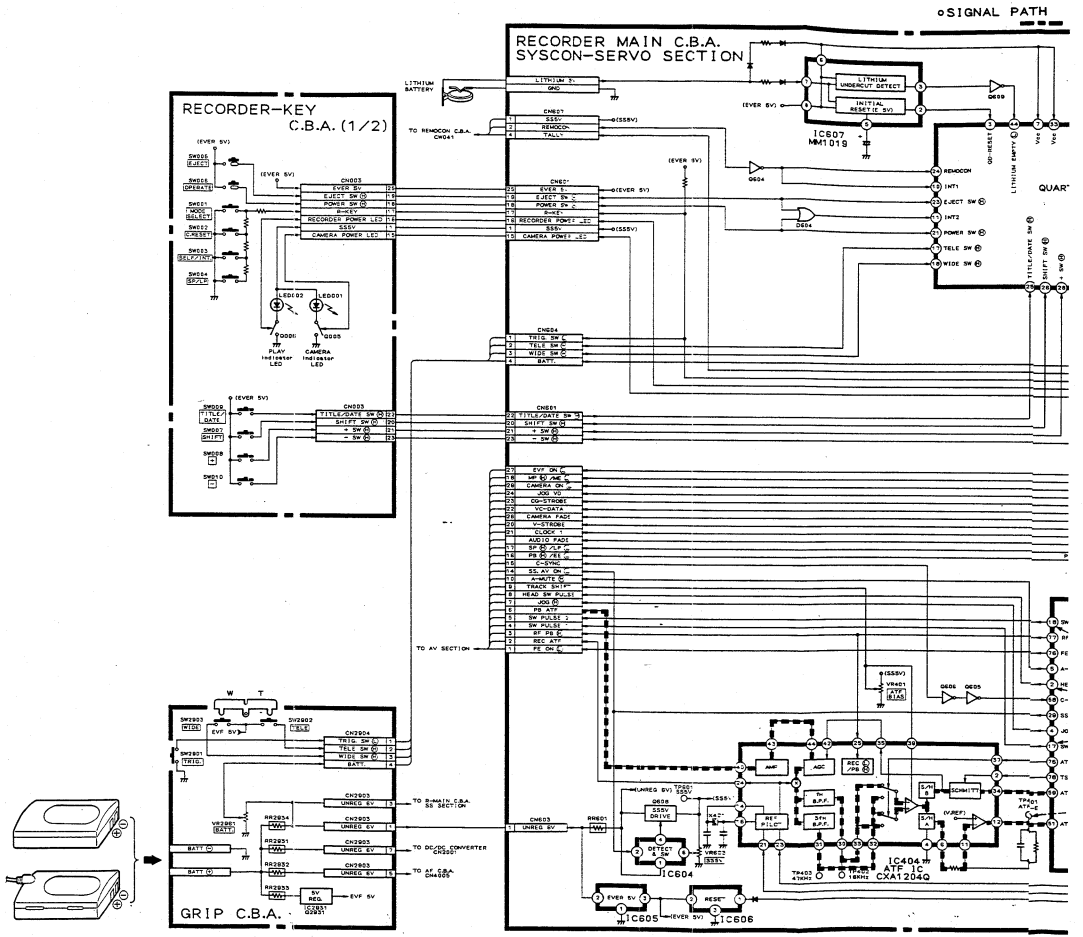
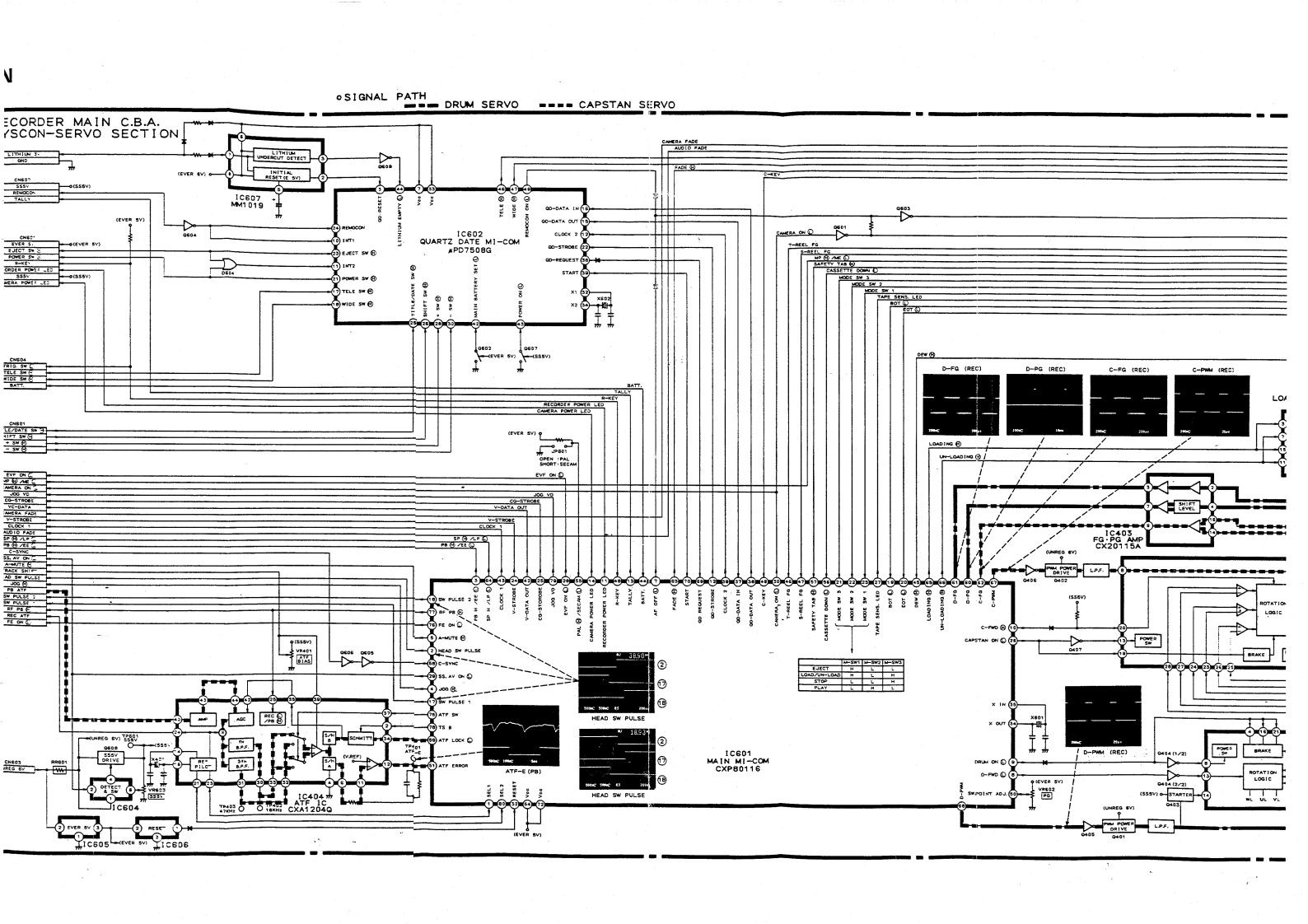
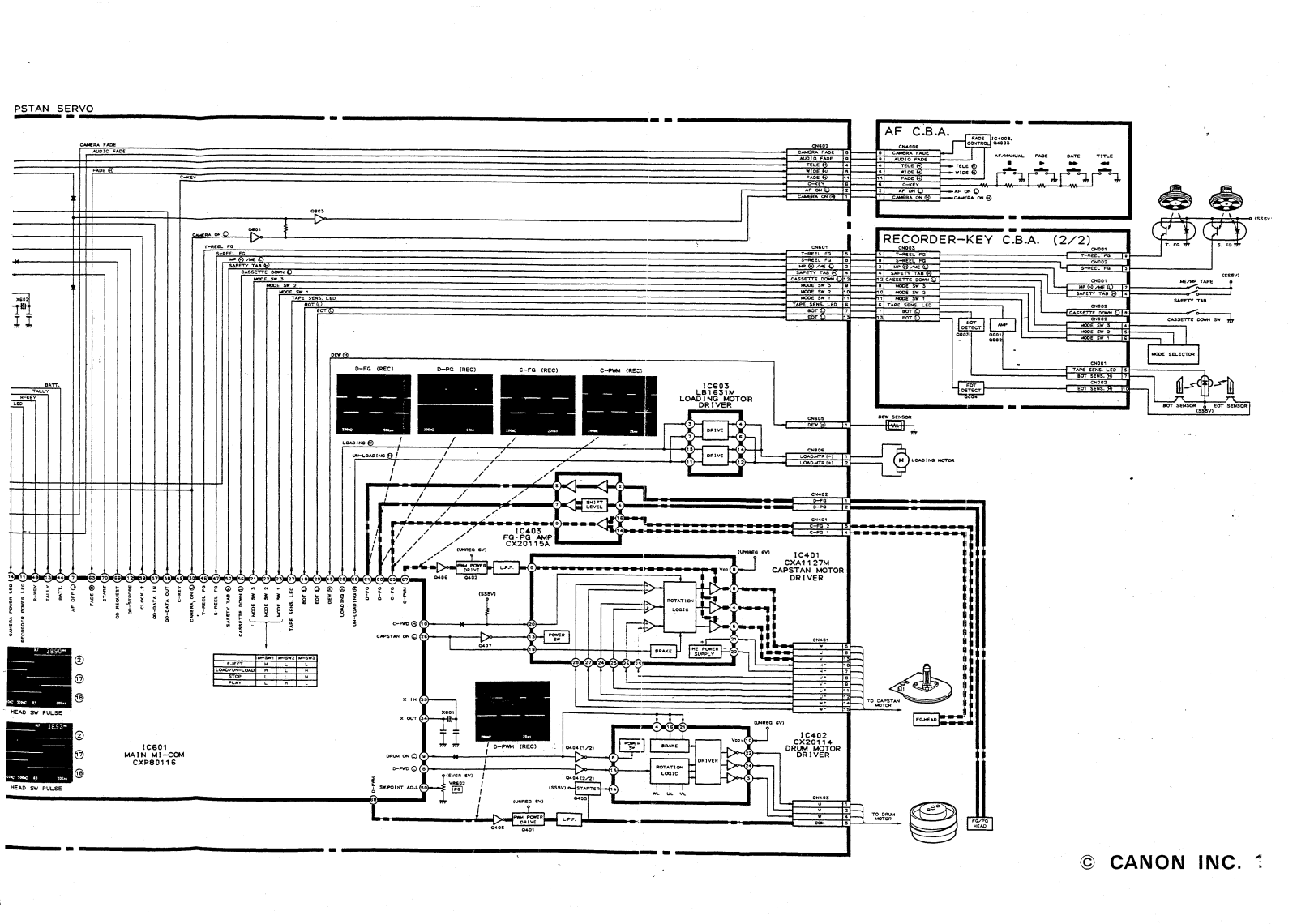
BLOCK DIAGRAM SYSCON-SERVO SECTION




SIGNAL PATH
DRUM SERVO
CAPSTAN SERVO
CORDER MAIN C.B.A.
YSCON-SERVO SECTION
IC607
MM1019
IC602
QUARTZ DATE MI-COM
μPD7508G
IC601
MAIN MI-COM
CXP80116
IC403
FG·PG AMP
CX20115A
IC404
ATF IC
CXA1204Q
IC604
IC605
IC606
D-FG (REC)
D-PG (REC)
C-FG (REC)
C-PWM (REC)
HEAD SW PULSE
ATF-E (PB)
HEAD SW PULSE
D-PWM (REC)


PSTAN SERVO
AF C.B.A.
RECORDER-KEY C.B.A. (2/2)
IC601
MAIN M1-COM
CXP80116
IC603
LB1631M
LOADING MOTOR
DRIVER
IC403
FG·PG AMP
CX20115A
IC401
CXA1127M
CAPSTAN MOTOR
DRIVER
IC402
CX20114
DRUM MOTOR
DRIVER
D-FG (REC)
D-PG (REC)
C-FG (REC)
C-PWM (REC)
D-PWM (REC)
HEAD SW PULSE
HEAD SW PULSE
LOADING MOTOR
TO CAPSTAN MOTOR
TO DRUM MOTOR
FG/PG HEAD
DEW SENSOR
BOT SENSOR
EOT SENSOR
CASSETTE DOWN SW
MODE SELECTOR
SAFETY TAB
ME/AP TAPE
T. FG
S. FG
EJECT
LOAD/UNLOAD
STOP
PLAY

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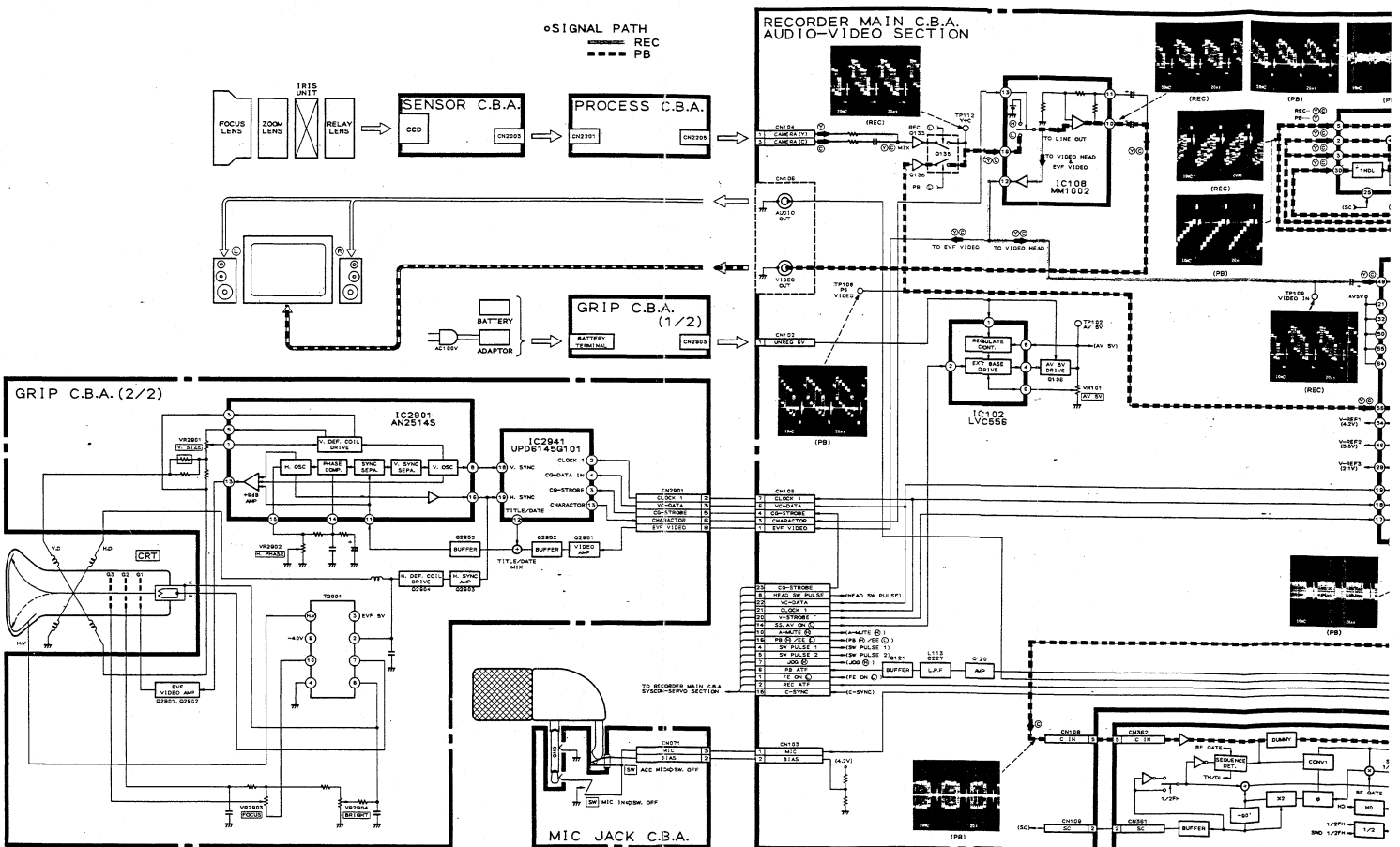
BLOCK DIAGRAM VIDEO SECTION



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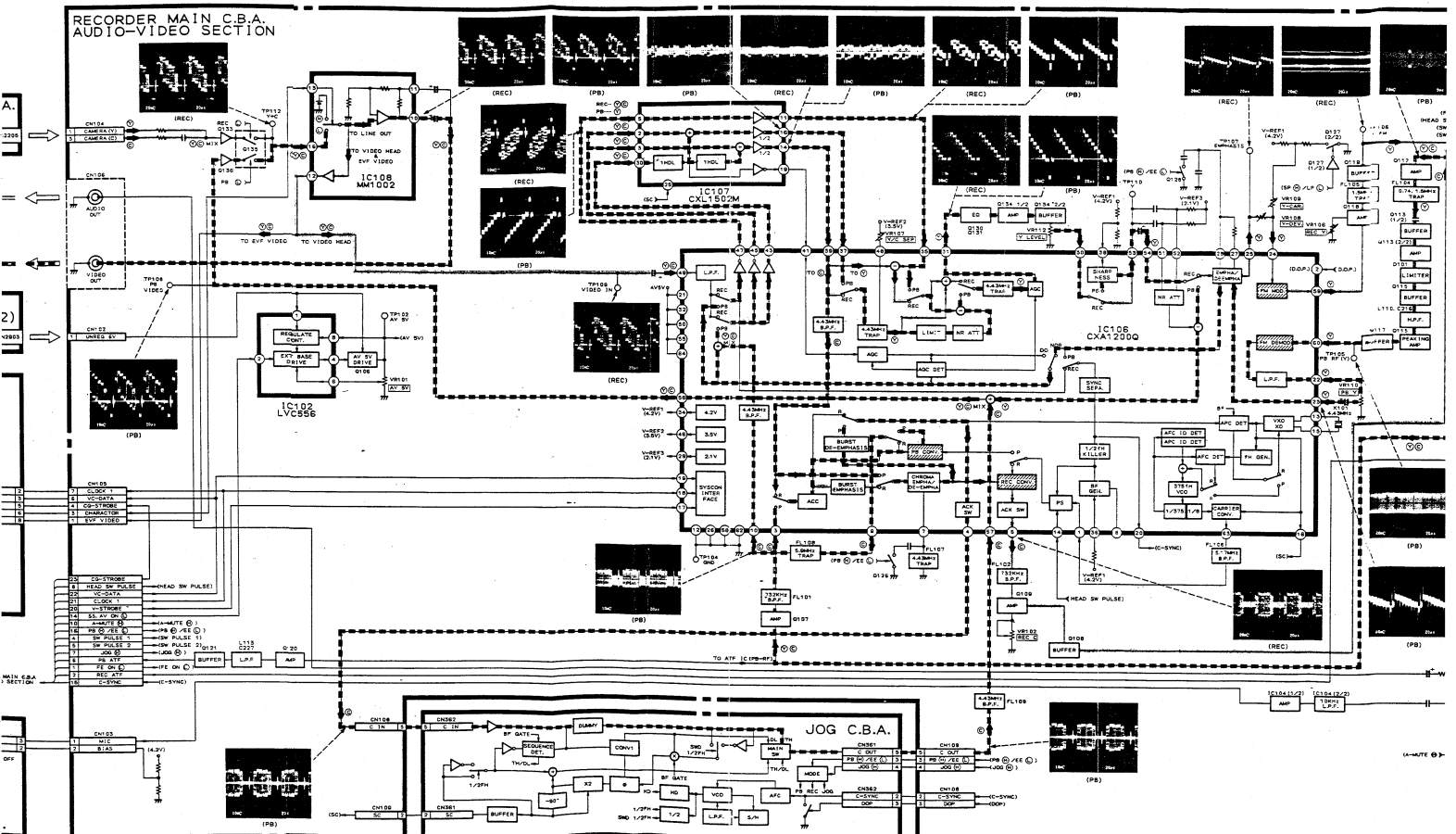
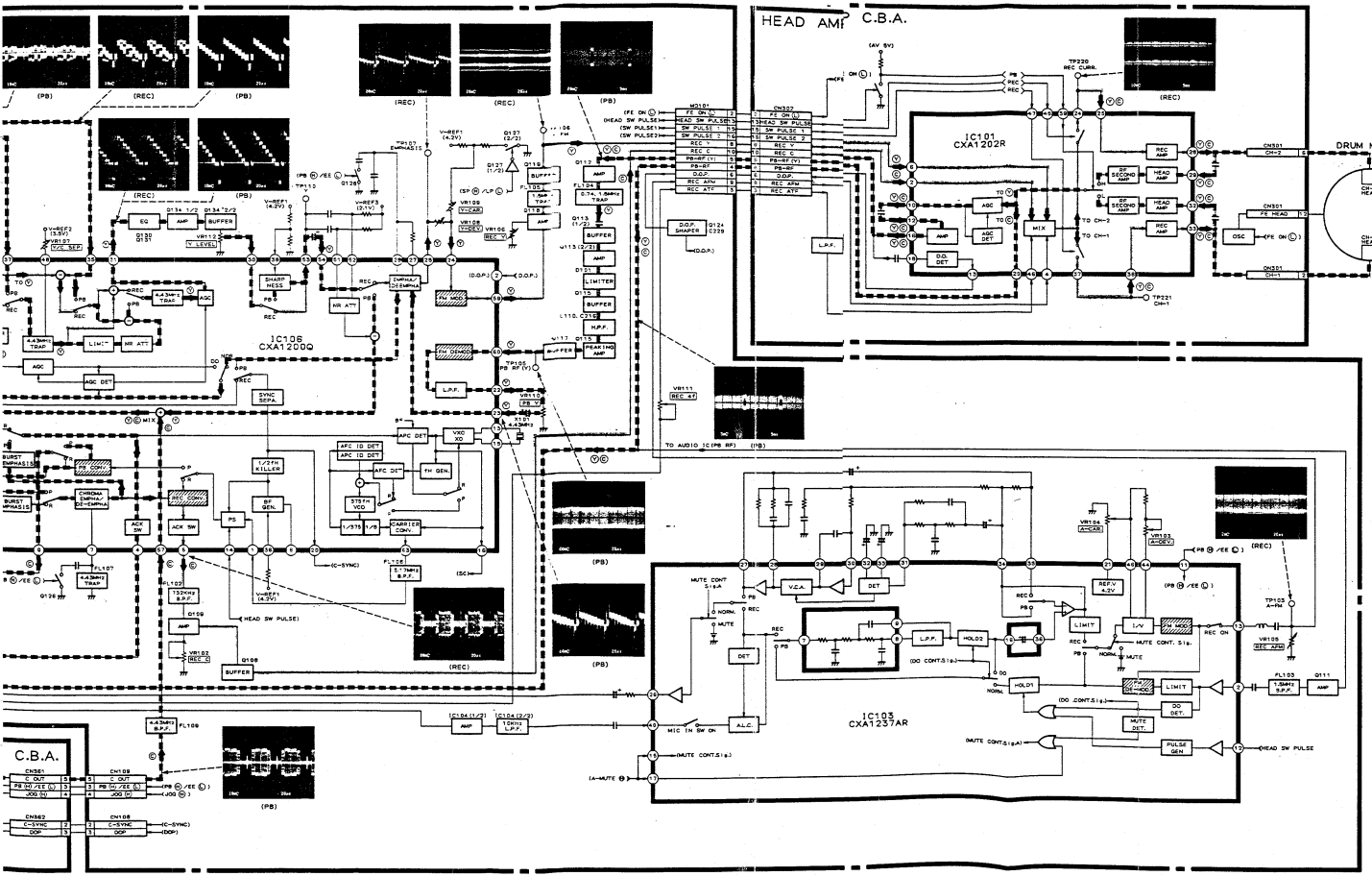

RECORDER MAIN C.B.A.
AUDIO-VIDEO SECTION
IC108
MM1002
IC107
CXL1502M
IC106
CXA1200Q
IC102
LVC556
JOG C.B.A.


HEAD AMP C.B.A.
IC101
CXA1202R
IC106
CXA1200Q
IC103
CXA1237AR
DRUM MOTOR
C.B.A.
(PB)
(REC)

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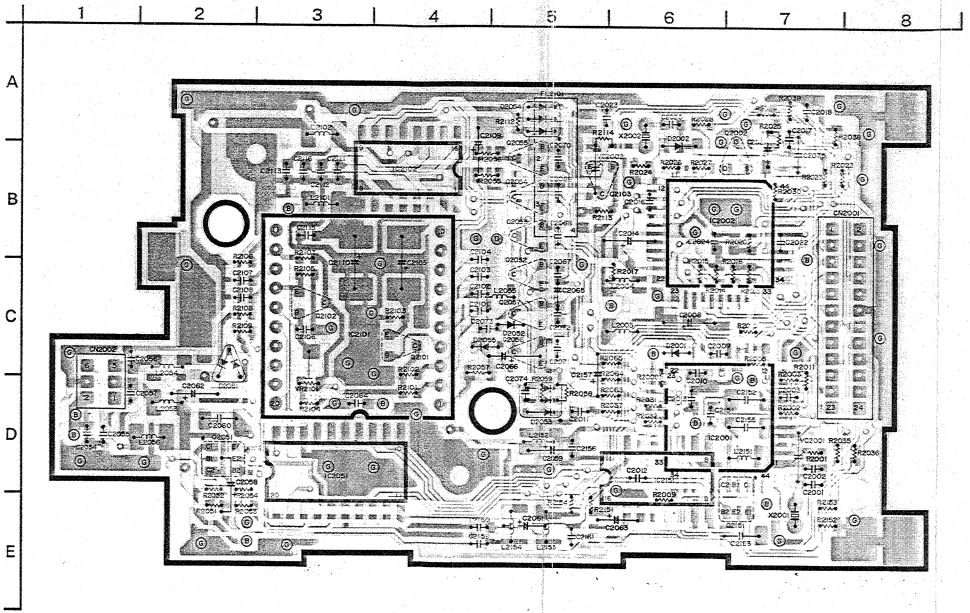
CIRCUIT BOARD DIAGRAM SENSOR・GRIP C.B.A.

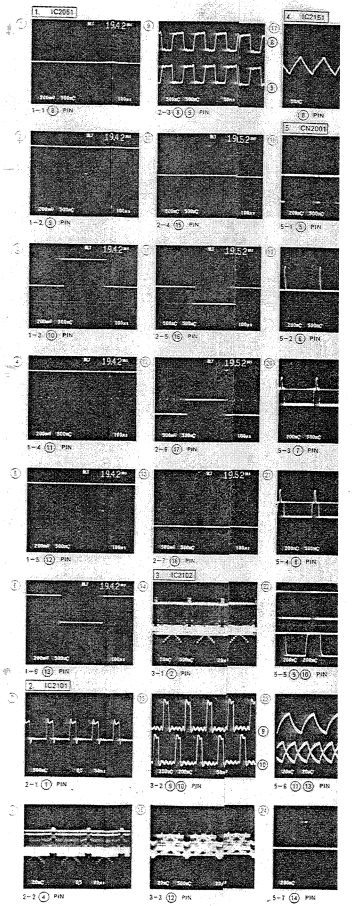
< NOTICE >
Sensor C. B. A. consists of four layers.
(Soldering, Component, Ground and Camera 5V patterns.)
※ Through-hole marks on each C. B. A. denote :
○ : Soldering side ⟷ Component side
Ⓖ : Soldering side (Component side) ⟷ Ground
Ⓑ : Soldering side (Component side) ⟷ Camera 5V

SENSOR C.B.A.

D2001	C-6
D2002	B-6
D2051	C-2
D2052	C-5
D2053	D-5
D2054	A-5
D2055	C-4
IC2001	D-6
IC2002	B-6
IC2051	D-3
IC2101	C-3
IC2102	B-4
IC2151	D-6
Q2002	B-7
Q2051	D-2
Q2052	C-5
Q2053	B-5
Q2054	B-5
Q2055	B-5
Q2056	C-5
Q2057	C-5
Q2101	C-4
Q2102	C-3
Q2103	B-5
Q2151	E-7



SIGNAL WAVEFORMS



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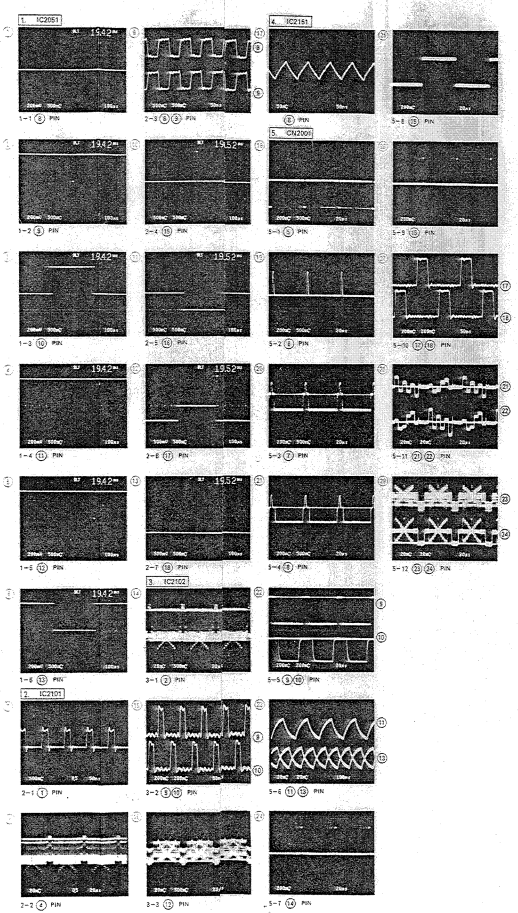
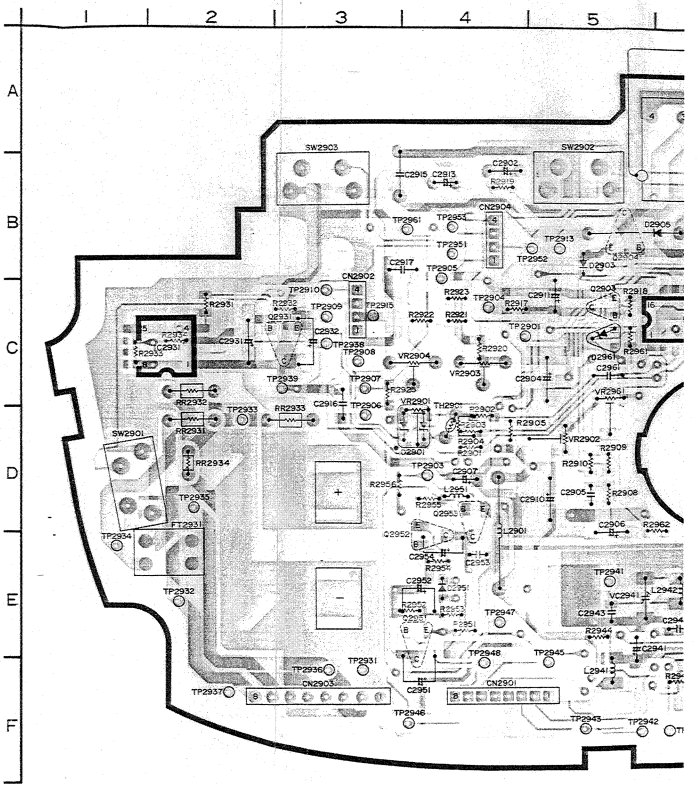
Ⅳ-5

SIGNAL WAVEFORMS



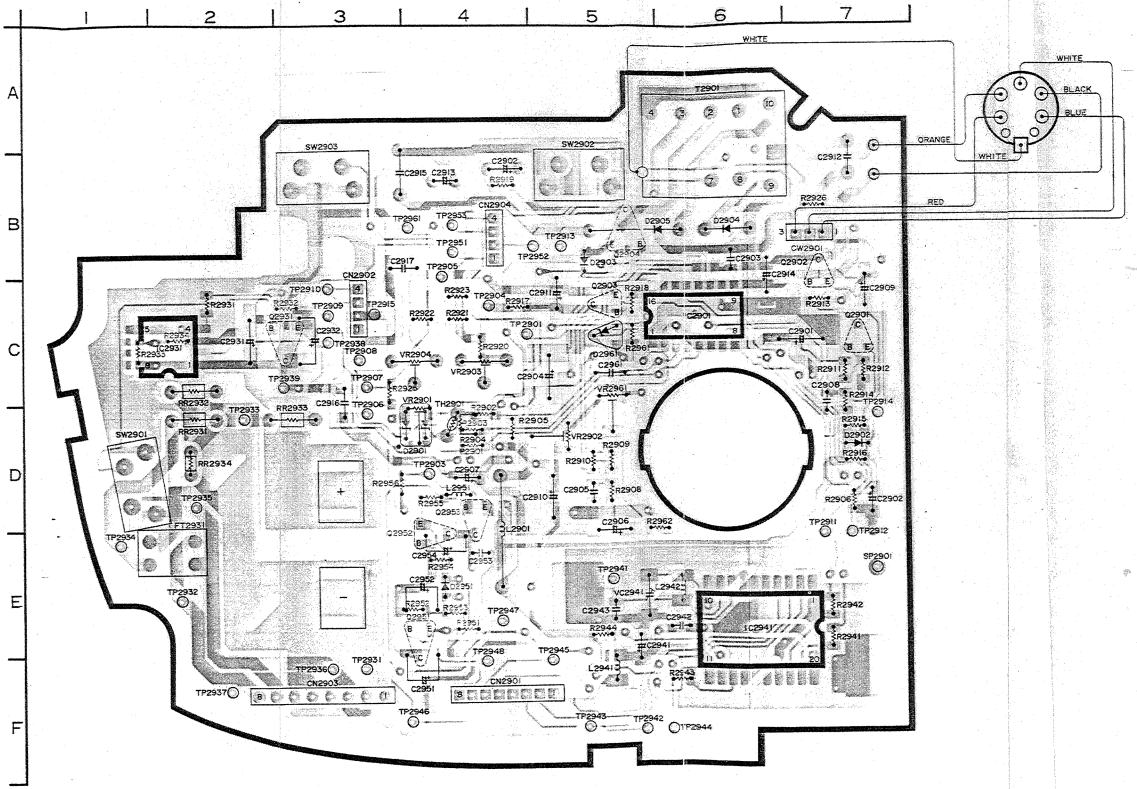
GRIP C.B.A.

D2901	D-4
D2902	D-7
D2903	B-5
D2904	B-6
D2905	B-5
D2951	E-4
D2961	C-5
IC2901	C-6
IC2931	C-2
IC2941	E-6
Q2901	C-7
Q2902	B-7
Q2903	C-5
Q2904	B-5
Q2931	C-3
Q2951	E-4
Q2952	D-4
Q2953	D-4

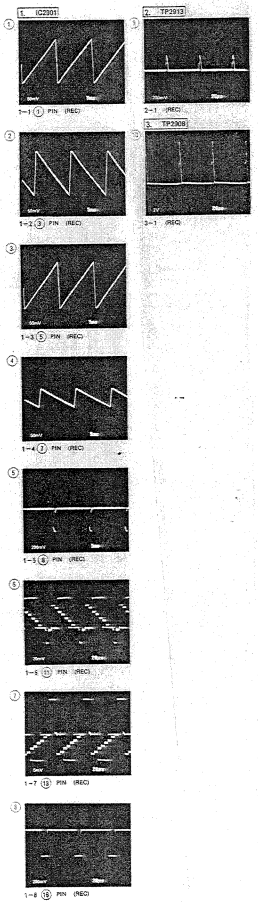


P C.B.A.

0 1	D – 4
0 2	D – 7
0 3	B – 5
0 4	B – 8
0 5	B – 5
5 1	E – 4
6 1	C – 5
0 1	C – 6
3 1	C – 2
4 1	E – 8
0 1	C – 7
0 2	B – 7
0 3	C – 5
0 4	B – 5
3 1	C – 3
5 1	E – 4
5 2	D – 4
5 3	D – 4



SIGNAL WAVEFORMS



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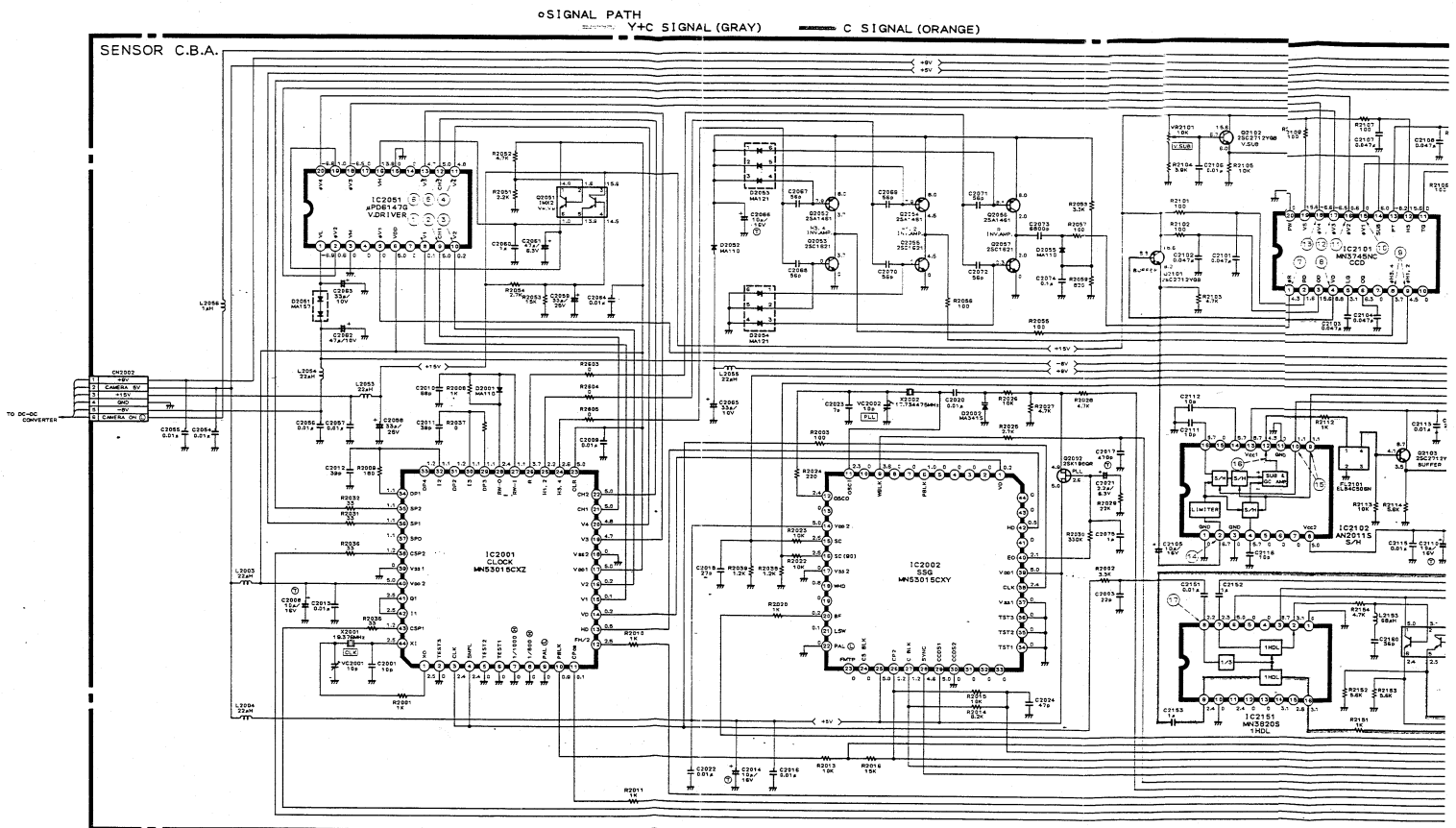
SCHEMATIC DIAGRAM SENSOR · GRIP C.B.A.



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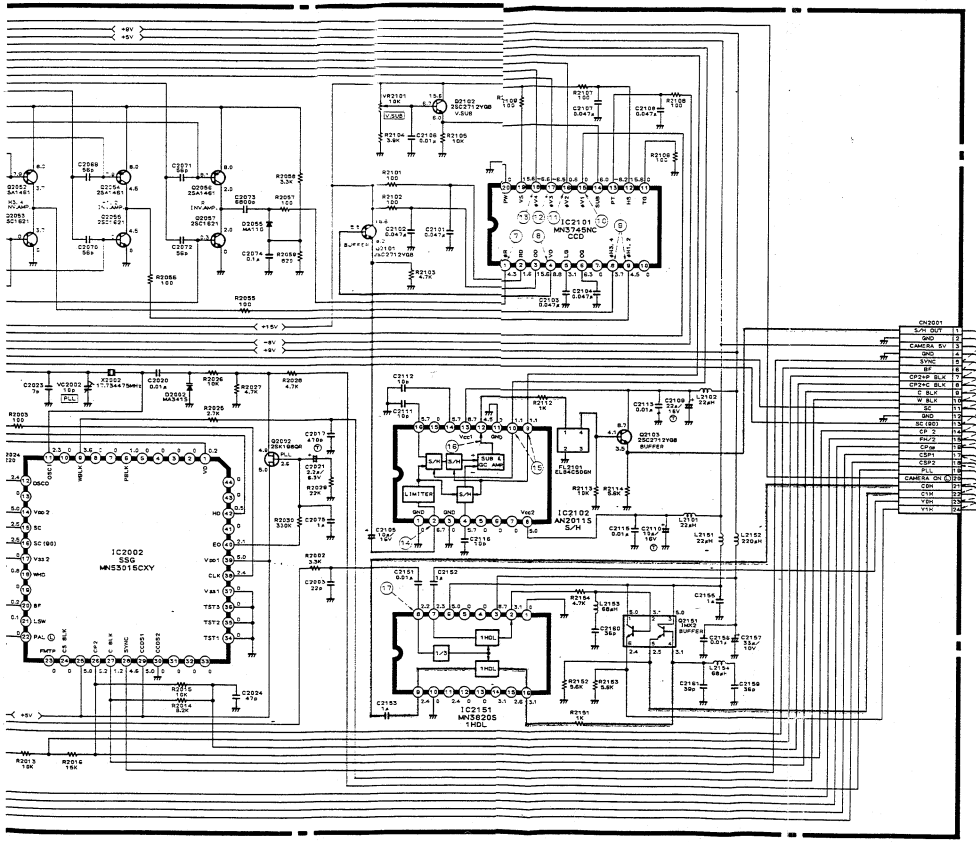
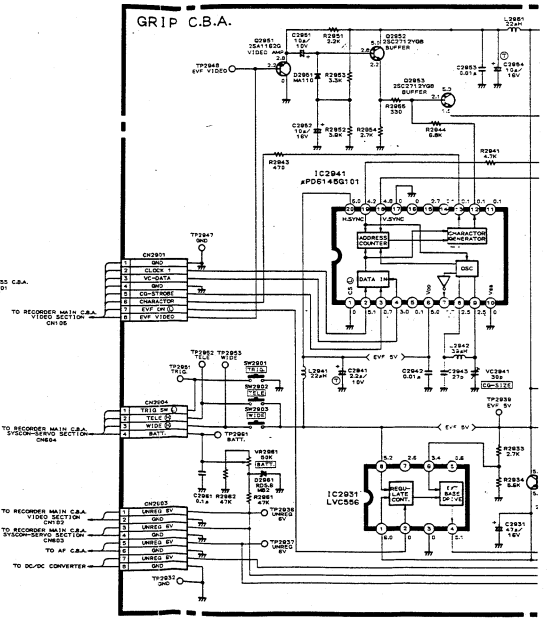
C SIGNAL (ORANGE)



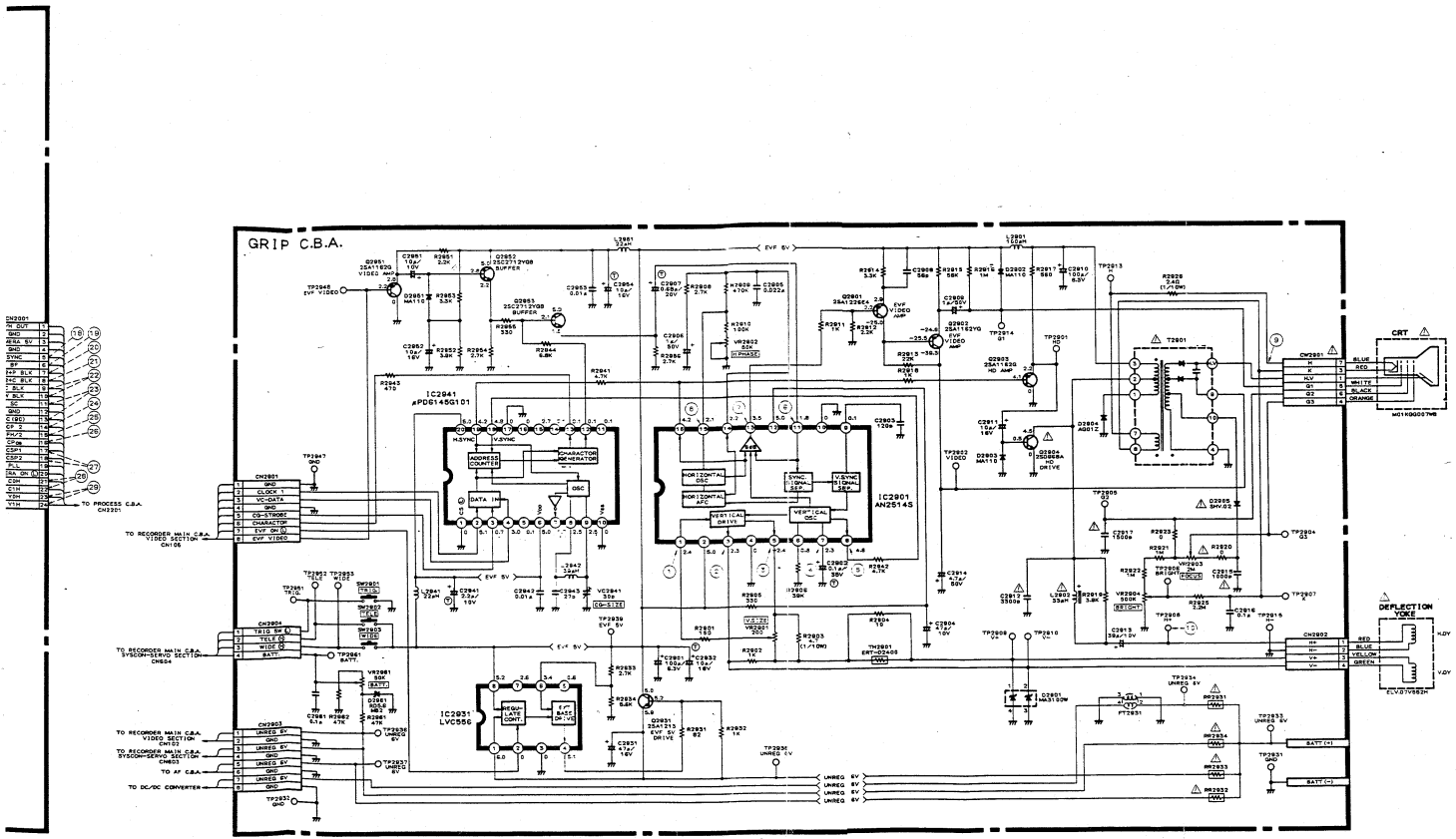
IC2002

IC2102 IC2151 IC2101

GRIP C.B.A.



IC2931 IC2941



IC2931 IC2941 IC2901

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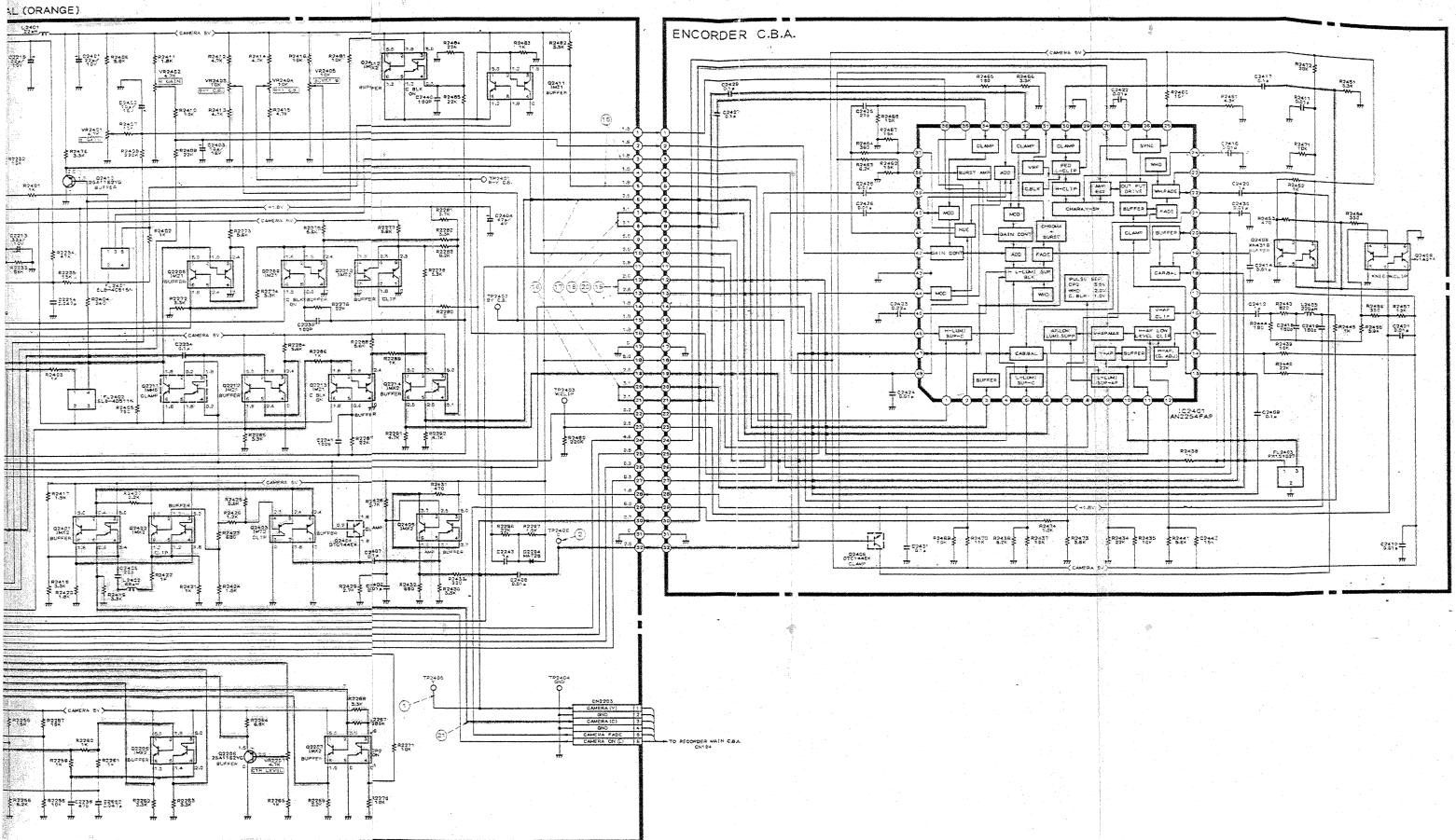
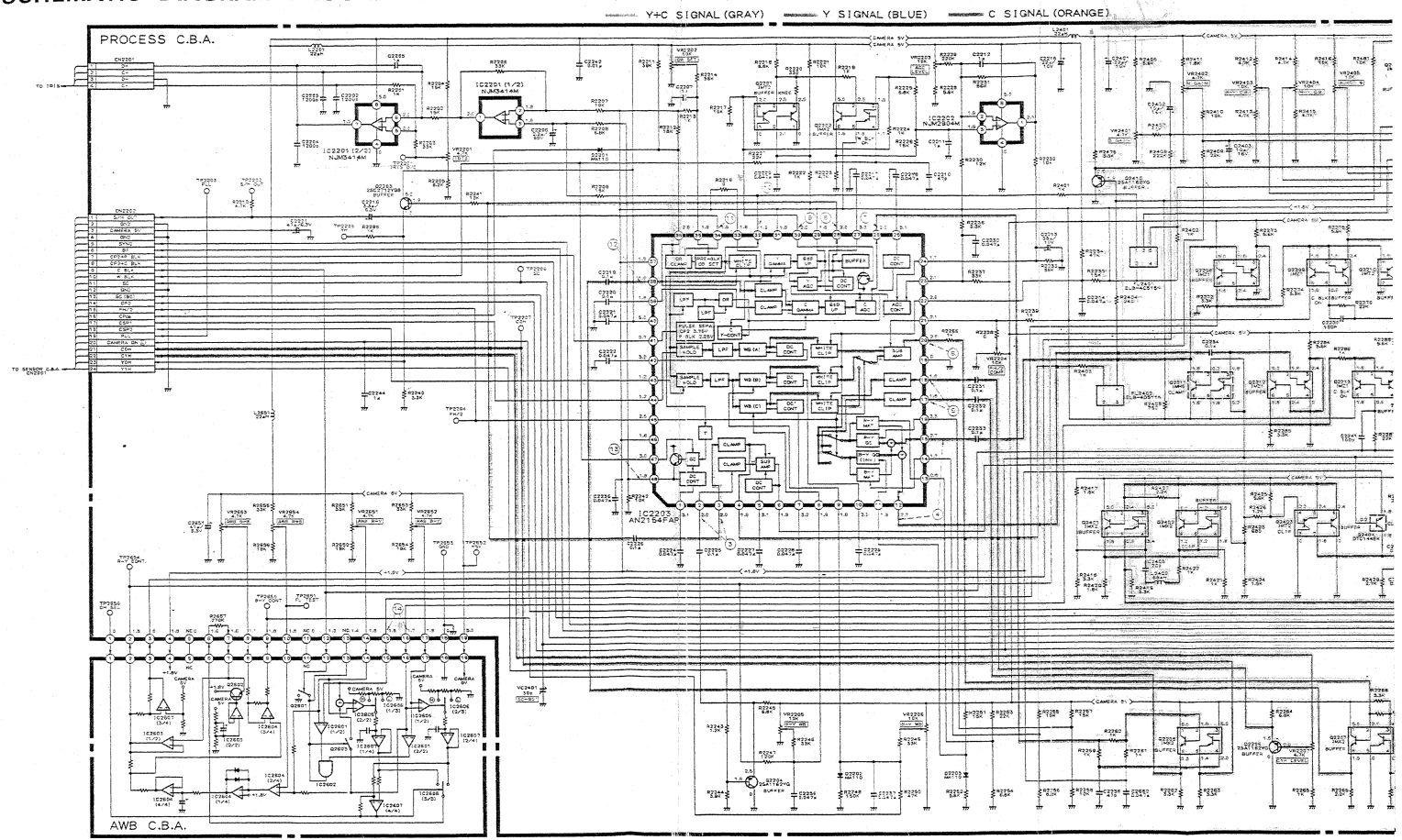

L (ORANGE)
ENCORDER C.B.A.
IC2401
TO RECORDER MAIN C.B.A.
CN104

SCHEMATIC DIAGRAM PROCESS C.B.A.



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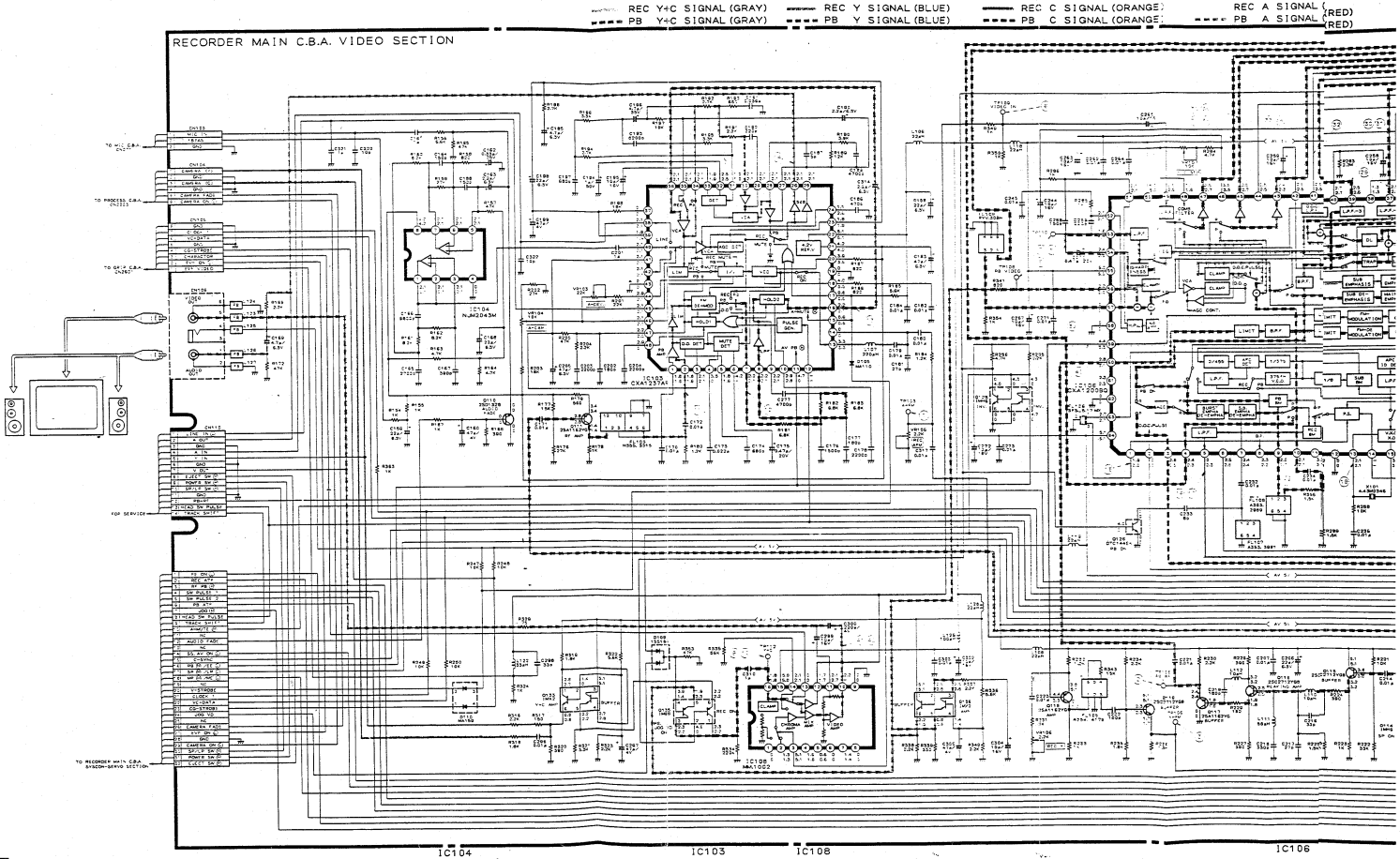
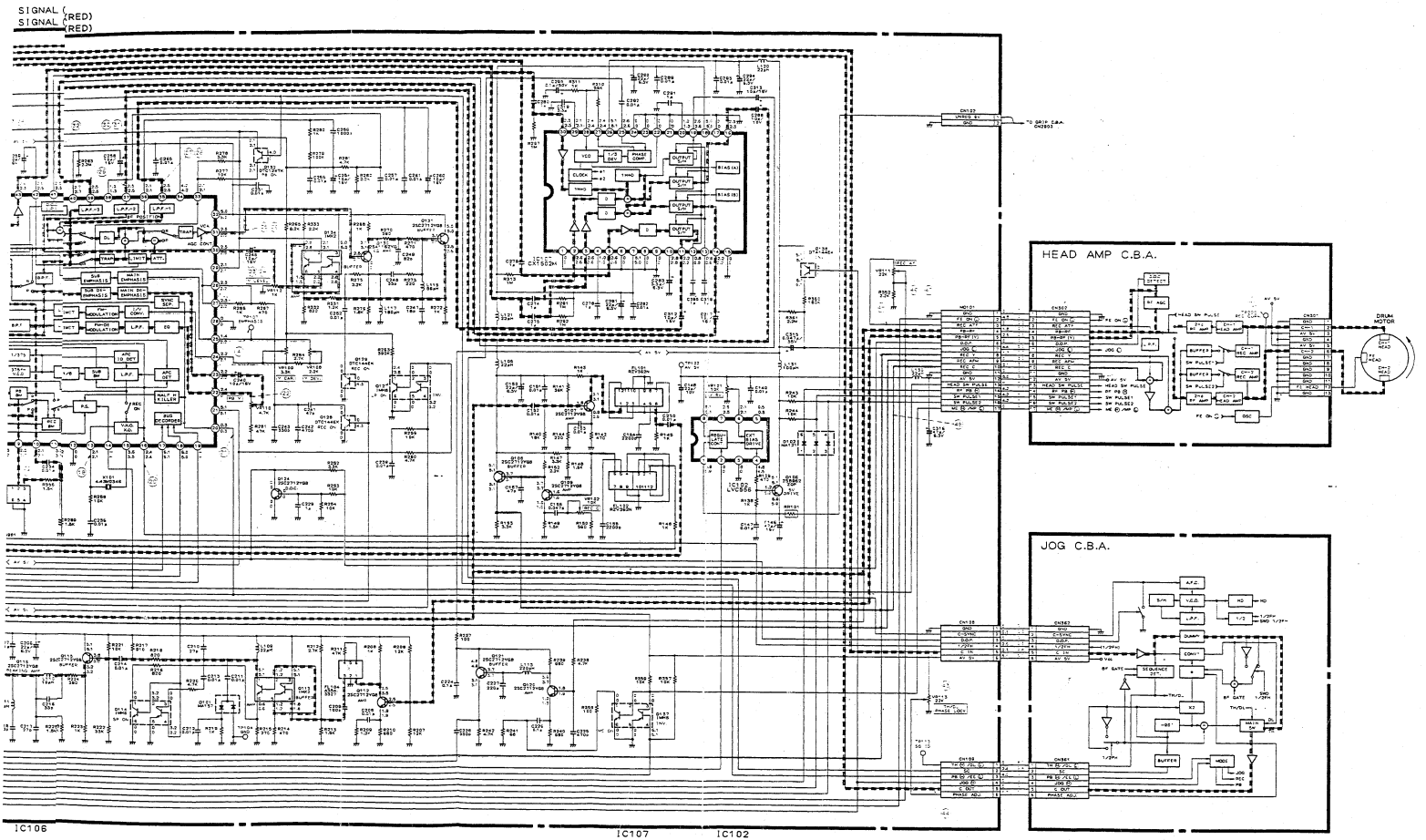
SCHEMATIC DIAGRAM RECORDER-MAIN C.B.A. (VIDEO SECTION)



01 Oct. 1989



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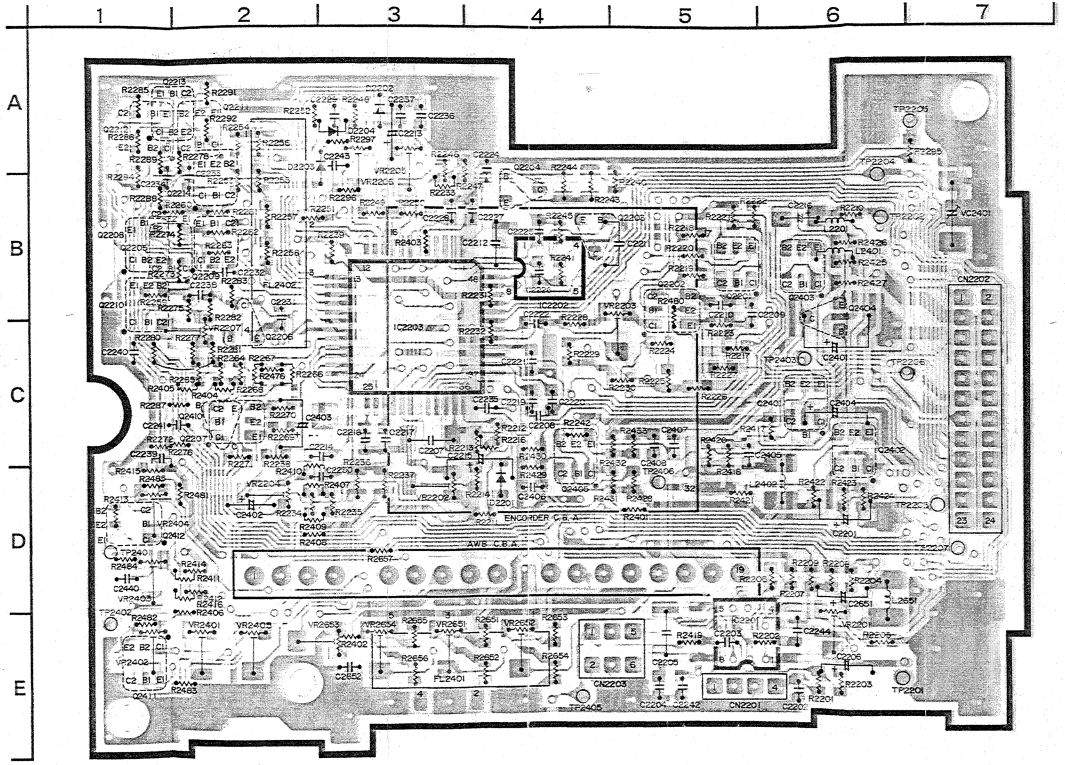
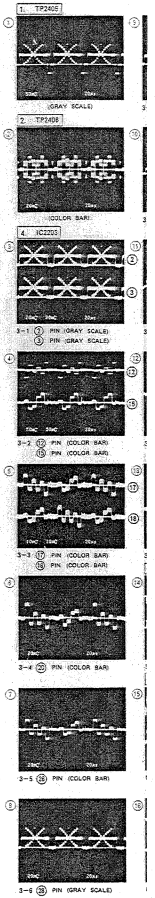
PROCESS C.B.A. (SOLDERING SIDE)

D2201	D-4
D2202	A-3
D2203	A-3
D2204	A-3
IC2201	E-5
IC2202	B-4
IC2203	C-3
Q2201	B-5
Q2202	B-5
Q2203	B-4
Q2204	B-4
Q2205	B-1
Q2206	C-2
Q2207	C-2
Q2208	B-1
Q2209	B-2
Q2210	B-1
Q2211	A-2
Q2212	A-1
Q2213	A-1
Q2214	B-2
Q2401	C-6
Q2402	C-6
Q2403	B-6
Q2404	B-6
Q2405	C-4
Q2410	C-2
Q2411	E-1
Q2412	D-1

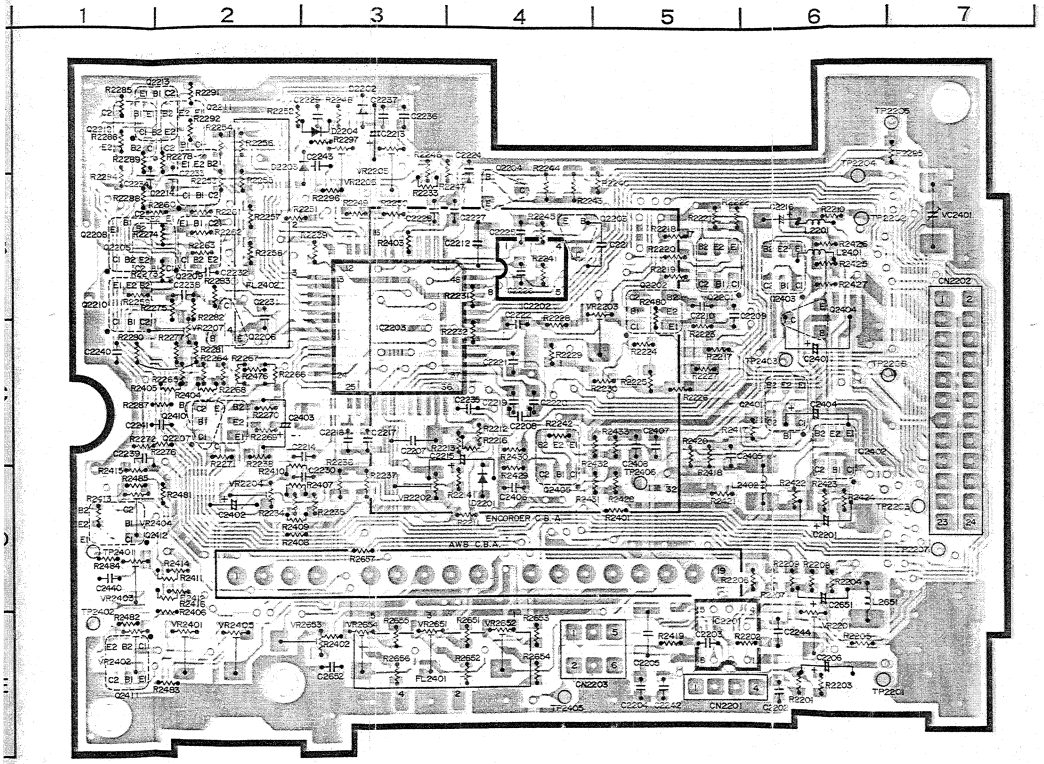


SIGNAL W

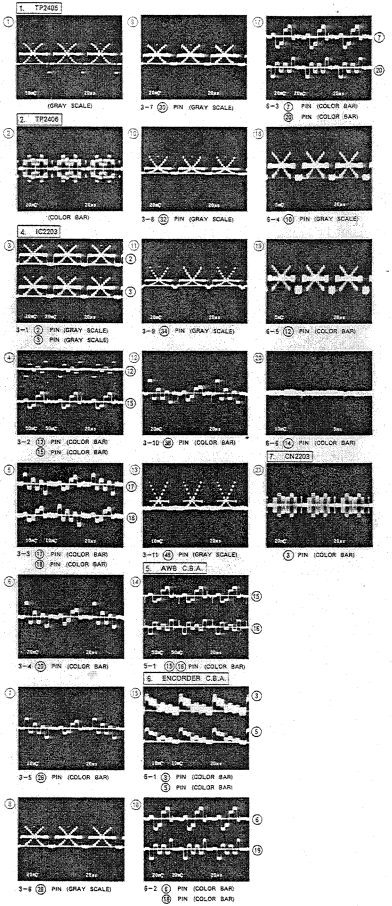


©

.A. (SOLDERING SIDE)



SIGNAL WAVEFORMS


1. TP2405
(GRAY SCALE)
3-7 (35) PIN (GRAY SCALE)
6-3 (7) PIN (COLOR BAR)
(28) PIN (COLOR BAR)
2. TP2406
(COLOR BAR)
3-8 (32) PIN (GRAY SCALE)
6-4 (10) PIN (GRAY SCALE)
4. IC2203
3-1 (2) PIN (GRAY SCALE)
(3) PIN (GRAY SCALE)
3-9 (34) PIN (GRAY SCALE)
6-5 (12) PIN (COLOR BAR)
3-2 (13) PIN (COLOR BAR)
(14) PIN (COLOR BAR)
3-10 (36) PIN (COLOR BAR)
6-6 (14) PIN (COLOR BAR)
7. CN2203
3-3 (17) PIN (COLOR BAR)
(18) PIN (COLOR BAR)
3-11 (45) PIN (GRAY SCALE)
(2) PIN (COLOR BAR)
5. AWB C.B.A.
3-4 (25) PIN (COLOR BAR)
5-1 (13) (19) PIN (COLOR BAR)
6. ENCORDER C.B.A.
3-5 (26) PIN (COLOR BAR)
6-1 (3) PIN (COLOR BAR)
(5) PIN (COLOR BAR)
3-6 (28) PIN (GRAY SCALE)
6-2 (4) PIN (COLOR BAR)
(16) PIN (COLOR BAR)

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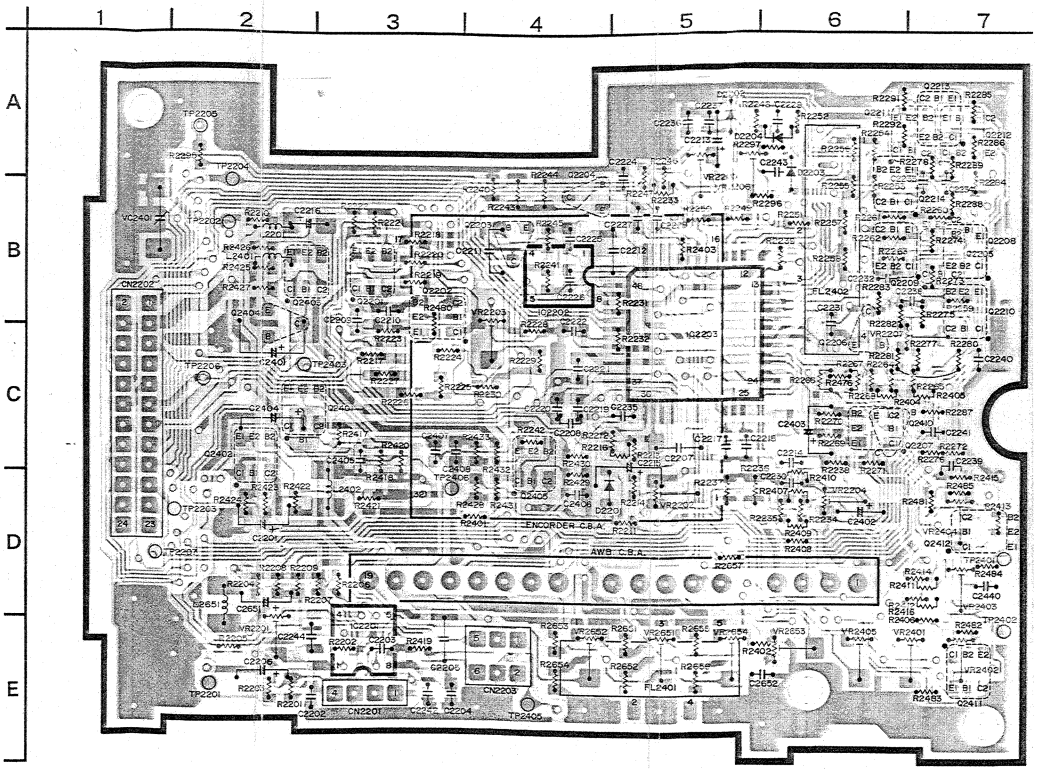
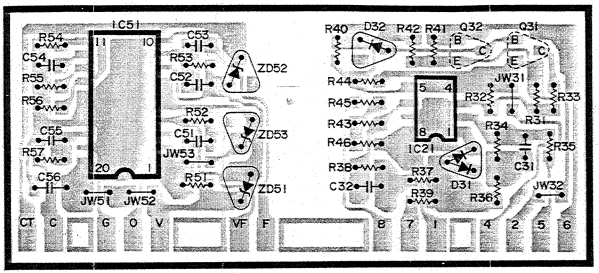
CIRCUIT BOARD DIAGRAM PROCESS C.B.A.

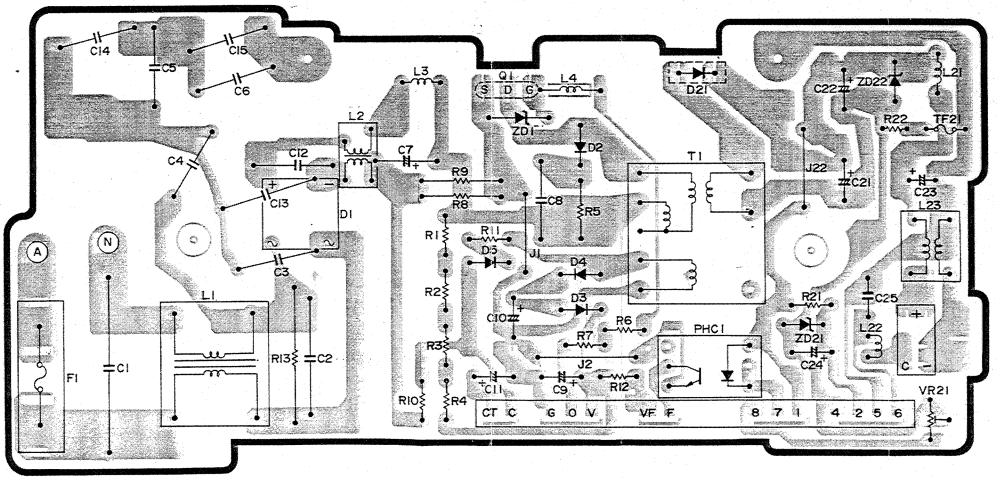
PROCESS C.B.A. (COMPONENT SIDE)

D2201	D-4
D2202	A-5
D2203	A-6
D2204	A-6
IC2201	E-3
IC2202	B-4
IC2203	C-5
Q2201	B-3
Q2202	B-3
Q2203	B-4
Q2204	B-4
Q2205	B-7
Q2206	C-6
Q2207	C-6
Q2208	B-7
Q2209	B-6
Q2210	B-7
Q2211	A-7
Q2212	A-7
Q2213	A-7
Q2214	B-6
Q2401	C-2
Q2402	C-2
Q2403	B-2
Q2404	B-2
Q2405	C-4
Q2410	C-6
Q2411	E-7
Q2412	D-7



CA-E7E, E7B, E7AS CIRCUIT BOARD DIAGRAM





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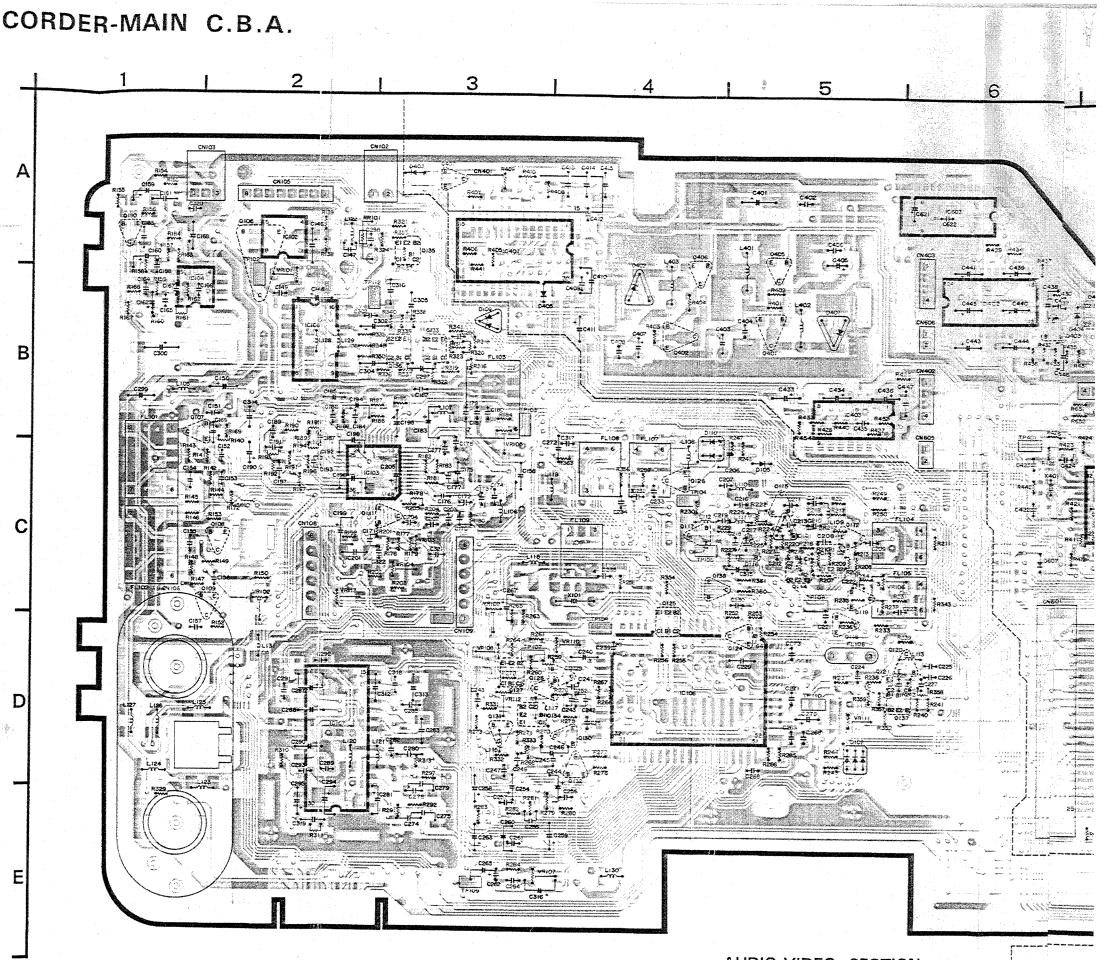
CIRCUIT BOARD DIAGRAM RECORDER-MAIN C.B.A.

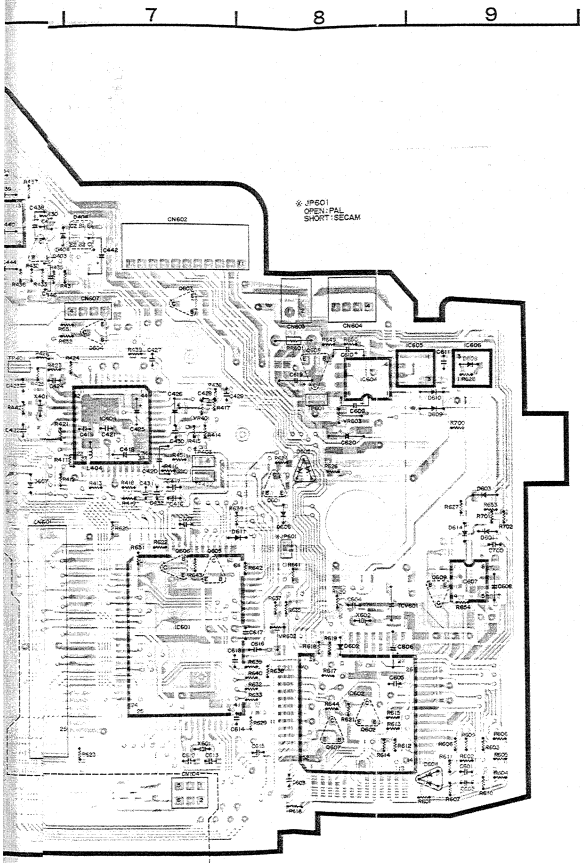
RECORDER MAIN C.B.A.
(SOLDERING SIDE)

D101	C-5
D102	D-5
D105	C-5
D109	B-3
D110	C-4
D401	B-5
D402	B-4
D403	A-3
D404	B-7
D405	B-3
D601	C-9
D602	D-8
D603	C-9
D604	E-9
D605	C-8
D606	C-8
D607	C-6
D608	B-9
D609	C-9
D610	C-9
D611	C-7
D614	C-9
IC102	A-2
IC103	C-2
IC104	B-1
IC106	D-4
IC107	D-2
IC108	B-2
IC401	A-3
IC402	B-6
IC403	B-5
IC404	C-7
IC601	D-7
IC602	D-8
IC603	A-6
IC604	C-8
IC605	B-9
IC606	B-9
IC607	D-9
Q106	A-2
Q107	B-1
Q108	C-2
Q109	C-2
Q110	A-1
Q111	C-3
Q112	C-5
Q113	C-5
Q114	C-5
Q115	C-5
Q116	C-5

Q117	C-4
Q118	D-5
Q119	C-5
Q120	D-6
Q121	D-5
Q124	D-5
Q125	D-4
Q126	C-4
Q127	D-3
Q128	D-3
Q129	D-4
Q130	D-4
Q131	D-3
Q132	D-4
Q133	B-3
Q134	D-3
Q135	A-3
Q136	B-3
Q137	D-5
Q138	C-4
Q401	B-5
Q402	B-4
Q403	B-6
Q404	B-7
Q405	B-5
Q406	B-4
Q407	A-3
Q601	C-8
Q602	D-8
Q603	B-7
Q604	B-7
Q605	D-7
Q606	D-7
Q607	E-8
Q608	B-8
Q609	D-9

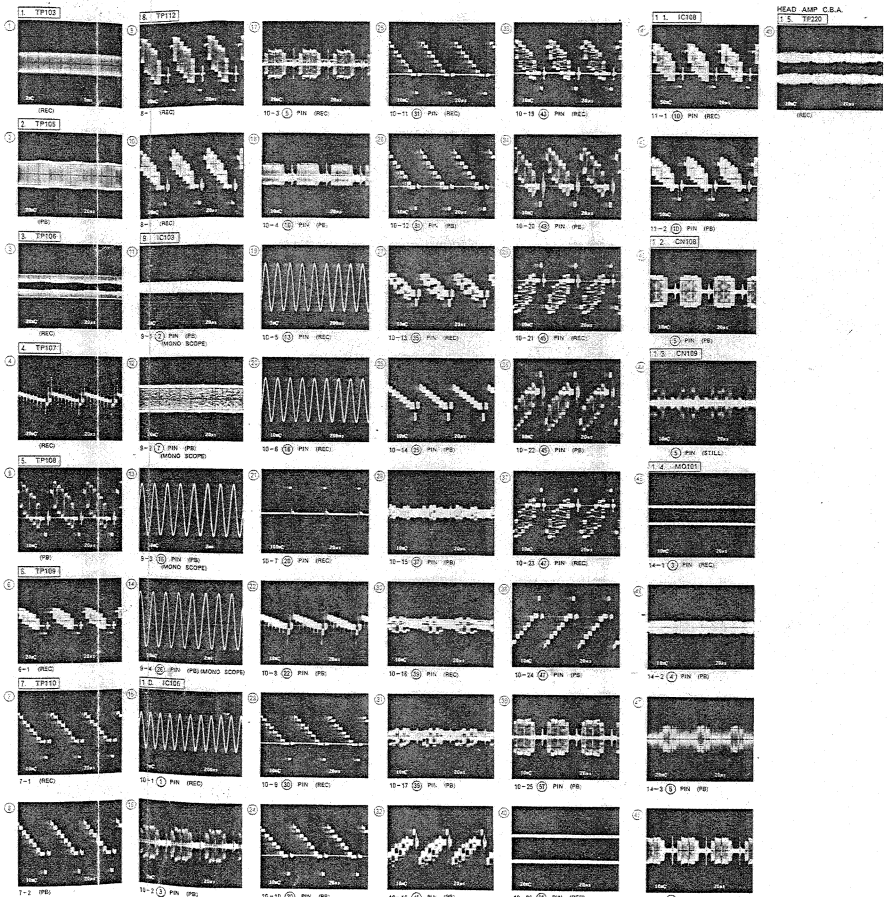


AUDIO-VIDEO SECTION



SYSCON-SERVO SECTION

SIGNAL WAVEFORMS



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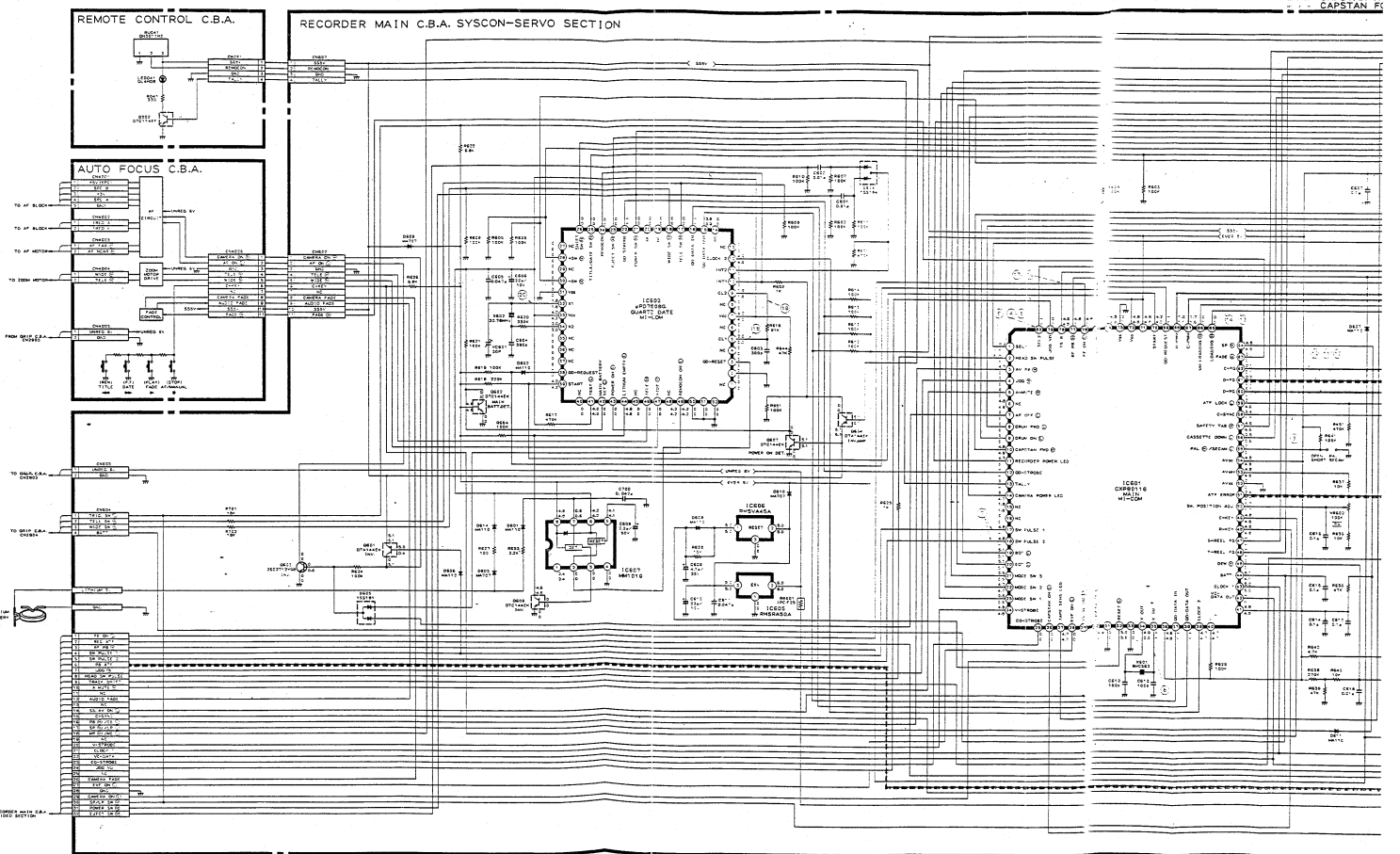
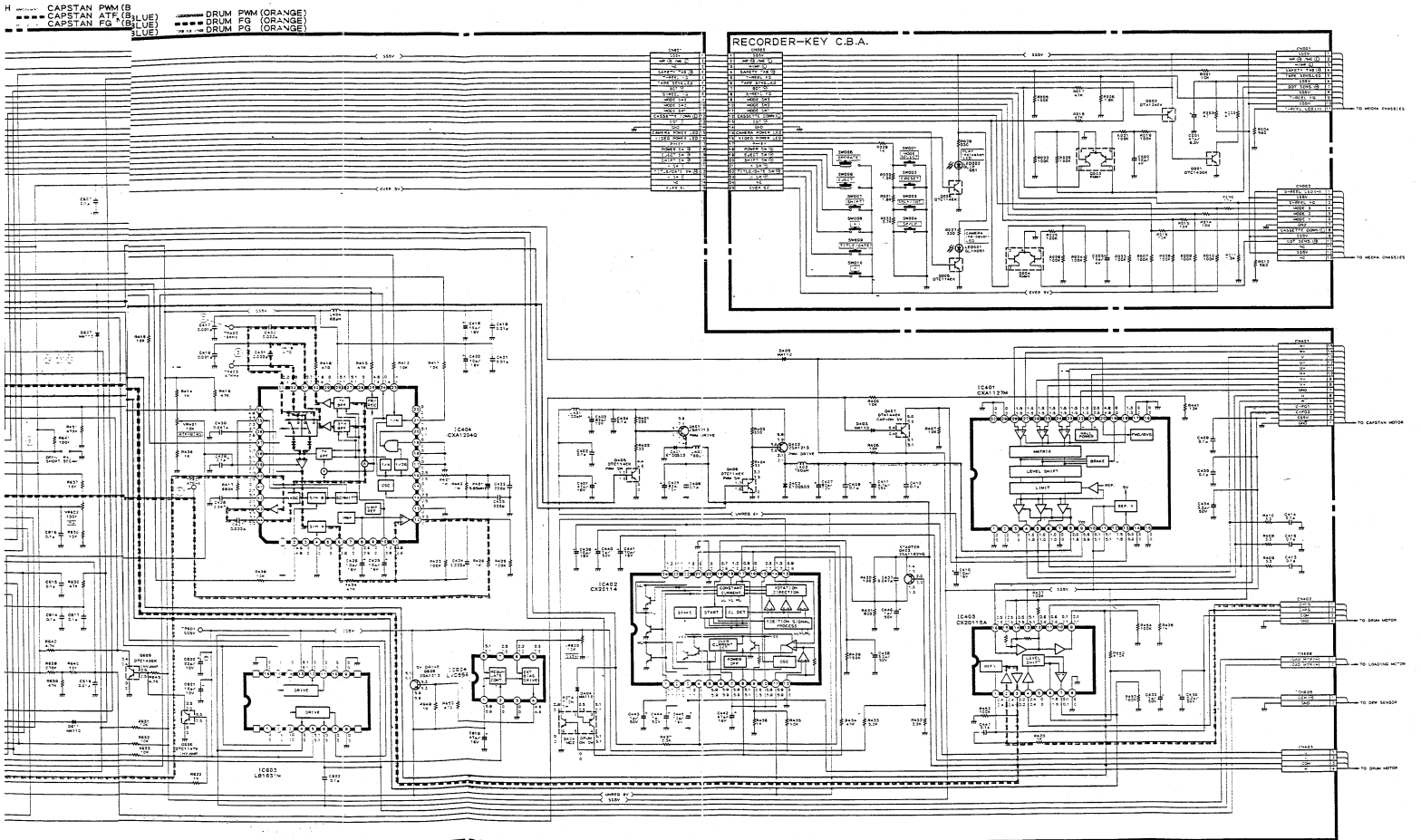
SCHEMATIC DIAGRAM RECORDER-MAIN C.B.A. (SYSCON-SERVO SECTION)



01 Oct. 1989


CAPSTAN PWM (B
CAPSTAN ATF (BLUE)
CAPSTAN FG (BLUE)
DRUM PWM (ORANGE)
DRUM FG (ORANGE)
DRUM PG (ORANGE)
RECORDER-KEY C.B.A.
TO MECHA CHASSIES
TO CAPSTAN MOTOR
TO DRUM MOTOR
TO LOADING MOTOR
TO DEW SENSOR
IC404 CXA1204Q
IC401 CXA1127M
IC402 CX20114
IC403 CX20115A
IC603 LB1631M
IC603 IC404
IC604
IC402
IC403 IC401

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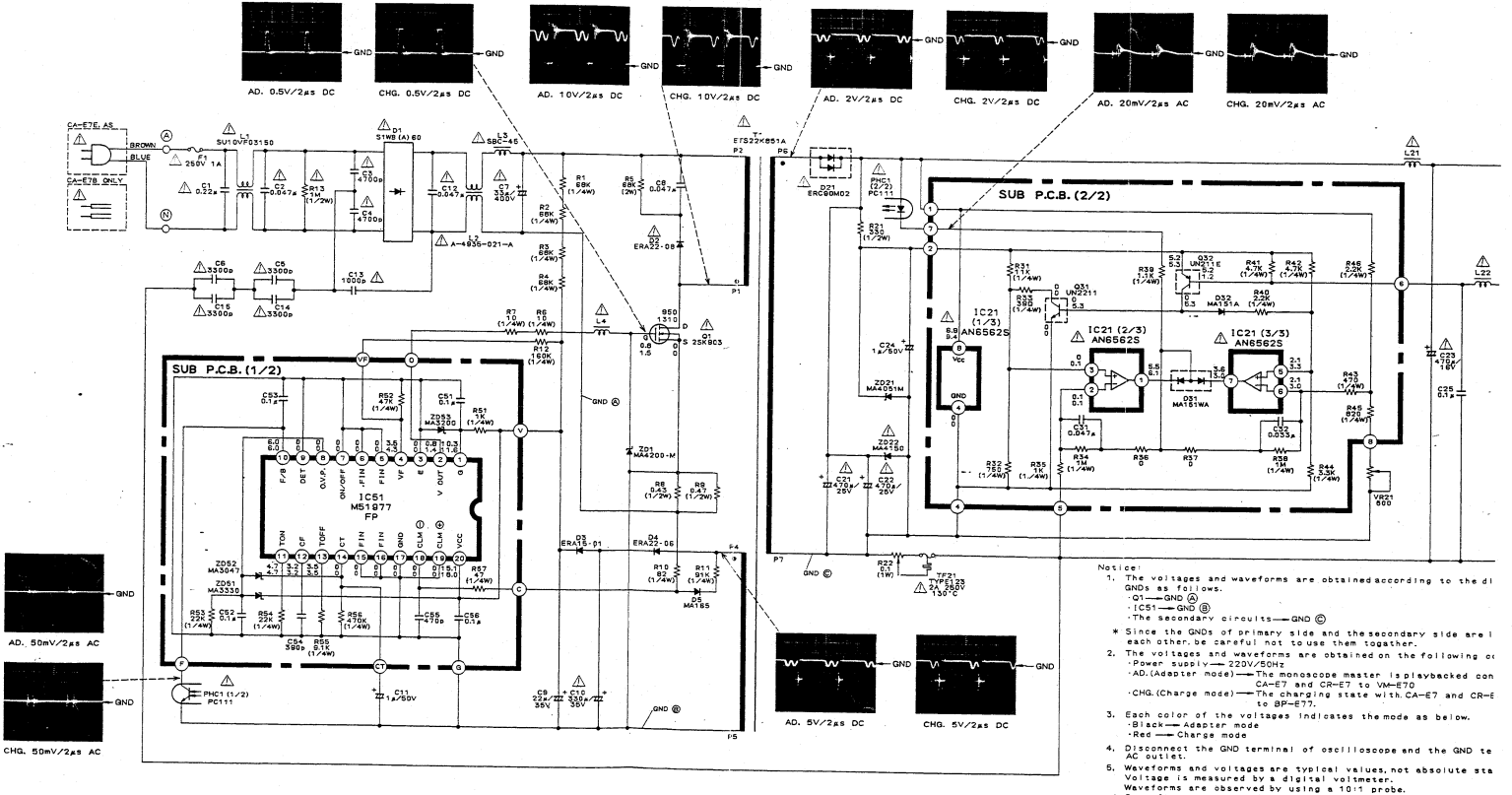
CA-E7E, E7B, E7AS SCHEMATIC DIAGRAM



Notice:

1. The voltages and waveforms are obtained according to the di
   GNDs as follows.
   · Q1 —— GND Ⓐ
   · IC51 —— GND Ⓑ
   · The secondary circuits —— GND Ⓒ
   * Since the GNDs of primary side and the secondary side are i
   each other. be careful not to use them together.
2. The voltages and waveforms are obtained on the following co
   · Power supply —— 220V/50Hz
   · AD. (Adapter mode) —— The monoscope master is playbacked con
   CA-E7 and CR-E7 to VM-E70
   · CHG. (Charge mode) —— The charging state with CA-E7 and CR-E
   to BP-E77.
3. Each color of the voltages indicates the mode as below.
   · Black —— Adapter mode
   · Red —— Charge mode
4. Disconnect the GND terminal of oscilloscope and the GND te
   AC outlet.
5. Waveforms and voltages are typical values, not absolute sta
   Voltage is measured by a digital voltmeter.
   Waveforms are observed by using a 10:1 probe.
   * Specifications are subject to change without notice for fu

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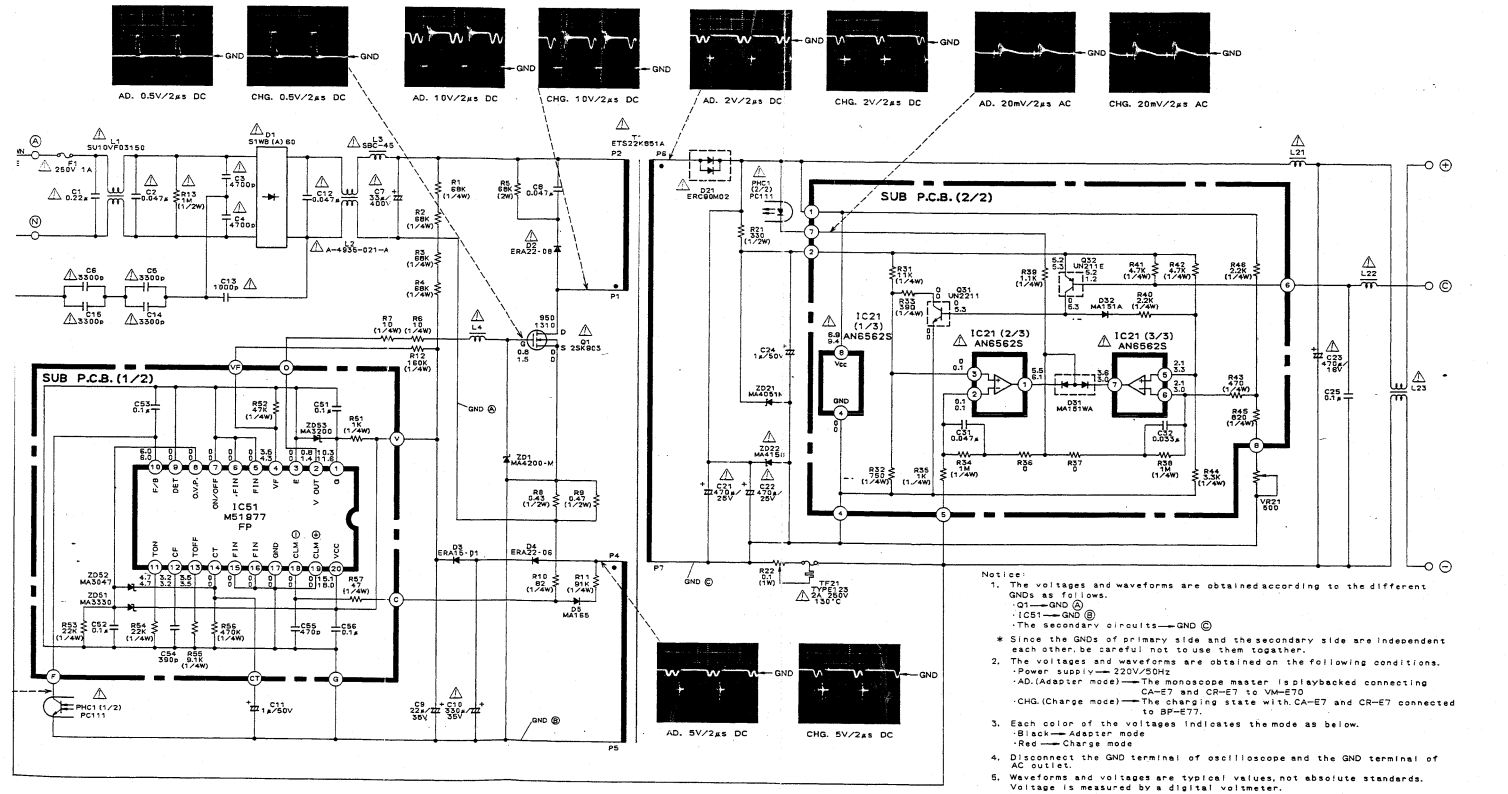
7AS SCHEMATIC DIAGRAM



Notice:

1. The voltages and waveforms are obtained according to the different GNDs as follows.
   - Q1 ⟶ GND Ⓐ
   - IC51 ⟶ GND Ⓑ
   - The secondary circuits ⟶ GND Ⓒ

   * Since the GNDs of primary side and the secondary side are independent each other, be careful not to use them together.
2. The voltages and waveforms are obtained on the following conditions.
   - Power supply ⟶ 220V/50Hz
   - AD.(Adapter mode) ⟶ The monoscope master is playbacked connecting CA-E7 and CR-E7 to VM-E70
   - CHG.(Charge mode) ⟶ The charging state with CA-E7 and CR-E7 connected to BP-E77.
3. Each color of the voltages indicates the mode as below.
   - Black ⟶ Adapter mode
   - Red ⟶ Charge mode
4. Disconnect the GND terminal of oscilloscope and the GND terminal of AC outlet.
5. Waveforms and voltages are typical values, not absolute standards. Voltage is measured by a digital voltmeter. Waveforms are observed by using a 10:1 probe.

   * Specifications are subject to change without notice for further improvement.

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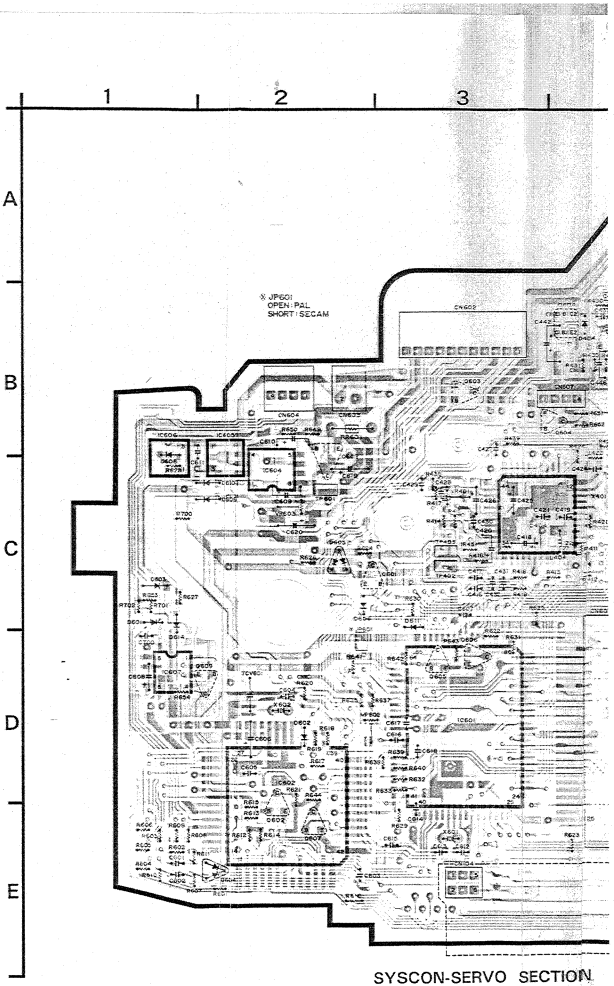
CIRCUIT BOARD DIAGRAM RECORDER-MAIN C.B.A.

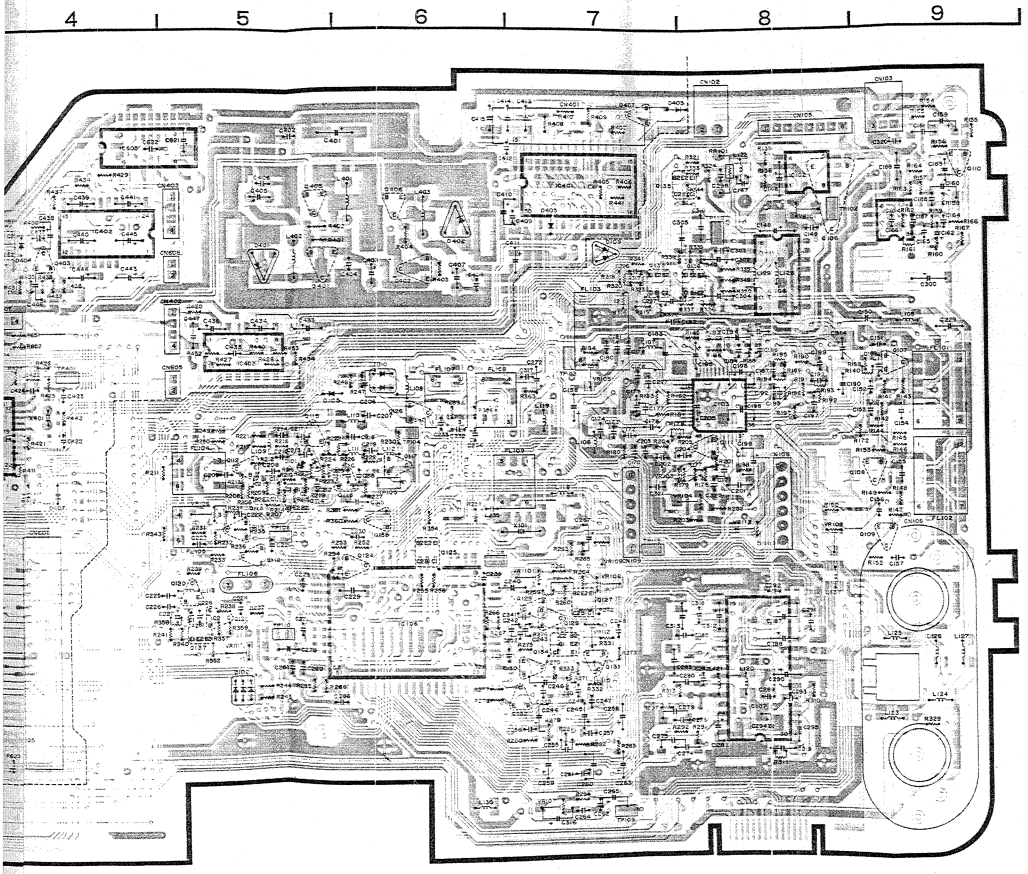
RECORDER MAIN C.B.A.
(COMPONENT SIDE)

D101	C-5
D102	D-5
D105	C-5
D109	B-7
D110	C-6
D401	B-5
D402	B-6
D403	A-7
D404	B-4
D405	B-7
D601	C-1
D602	D-2
D603	C-1
D604	E-2
D605	C-2
D606	C-2
D607	C-4
D608	B-1
D609	C-2
D610	C-2
D611	C-3
D614	C-1
IC102	A-8
IC103	C-8
IC104	B-9
IC106	D-6
IC107	D-8
IC108	B-8
IC401	A-7
IC402	B-4
IC403	B-5
IC404	C-3
IC601	D-3
IC602	D-2
IC603	A-4
IC604	C-2
IC605	B-2
IC606	B-1
IC607	D-1
Q106	A-8
Q107	B-9
Q108	C-9
Q109	C-9
Q110	A-9
Q111	C-8
Q112	C-5
Q113	C-5
Q114	C-5
Q115	C-5
Q116	C-6

Q117	C-6
Q118	D-5
Q119	C-5
Q120	D-5
Q121	D-5
Q124	D-6
Q125	D-6
Q126	C-6
Q127	D-7
Q128	D-7
Q129	D-7
Q130	D-7
Q131	D-7
Q132	D-7
Q133	B-7
Q134	D-7
Q135	A-8
Q136	B-8
Q137	D-5
Q138	C-6
Q401	B-5
Q402	B-6
Q403	B-4
Q404	B-4
Q405	A-5
Q406	B-6
Q407	A-7
Q601	C-2
Q602	E-2
Q603	B-3
Q604	B-4
Q605	D-3
Q606	D-3
Q607	E-2
Q608	C-2
Q609	D-2

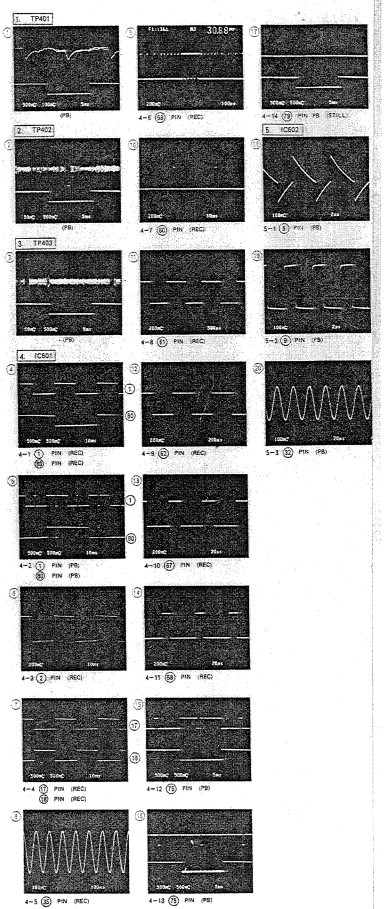


SYSCON-SERVO SECTION



AUDIO-VIDEO SECTION

SIGNAL WAVEFORMS



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Canovision 8

SERVICE MANUAL

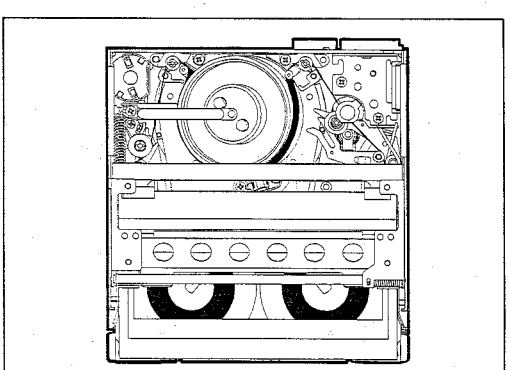
MC-4B

NTSC

PAL

SECAM

MECHANICAL CHASSIS



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Video Technical Service Dept.
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Chapter 1 Operations

1.Main Parts in Mechanical Section

1-1 Locations and Nomenclatures

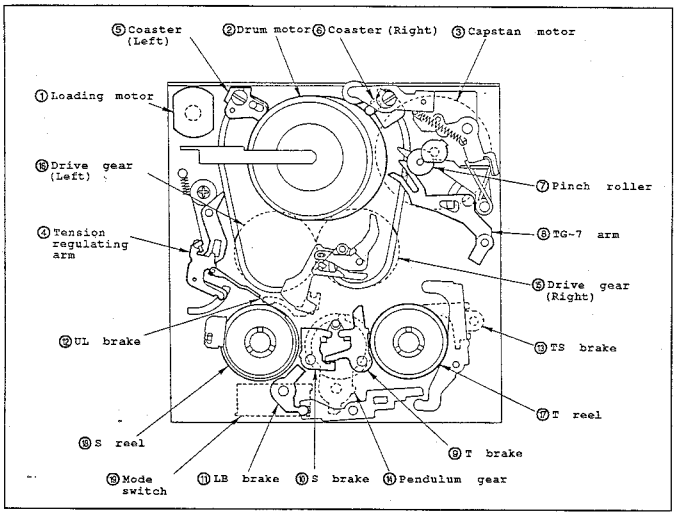


Fig.I-1

1-2 Relationships between Each Mode and Mode Switch

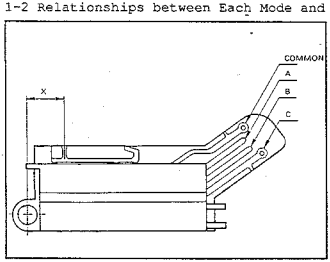


Fig.I-2

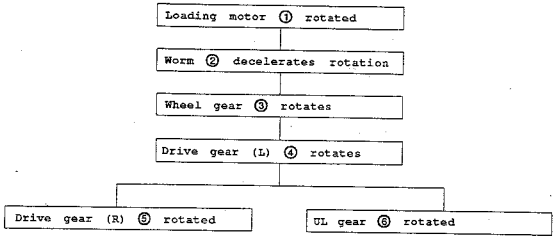
Modes	X (mm)	A	B	C
Eject	1.7-2.7	opened	opened	shorted
Blank	2.7-5.7	opened	opened	opened
Load/Unload	5.7-6.7	opened	shorted	shorted
Blank	6.7-8.1	opened	shorted	opened
Stop	8.1-9.1	shorted	shorted	opened
Blank	9.1-12.0	shorted	opened	opened
Play	12.0-13.3	shorted	opened	shorted

Table I-1

Note: "Opened" and "Shorted" in the table is versus the COMMON.

2.Operation in Each Section

2-1 Gear Train


Loading motor ① rotated
Worm ② decelerates rotation
Wheel gear ③ rotates
Drive gear (L) ④ rotates
Drive gear (R) ⑤ rotated
UL gear ⑥ rotated

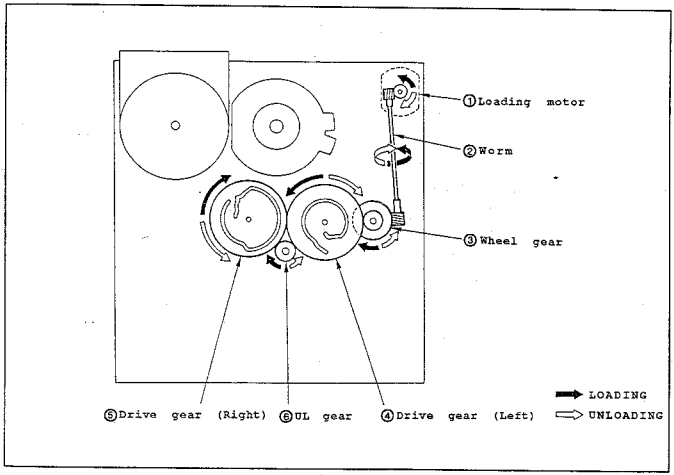
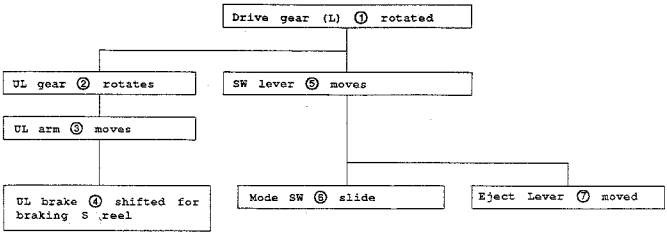


Fig.I-3

2-2 Mode SW, Eject Lever, UL Brake


Drive gear (L) ① rotated
UL gear ② rotates
SW lever ⑤ moves
UL arm ③ moves
UL brake ④ shifted for braking S reel
Mode SW ⑥ slide
Eject Lever ⑦ moved

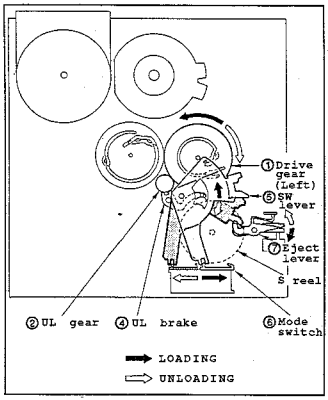


Fig.I-4

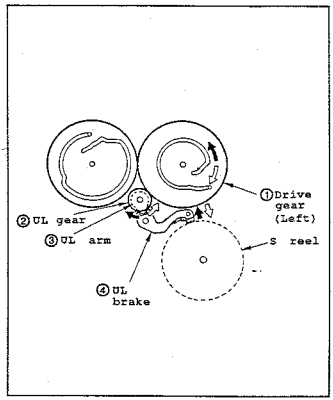
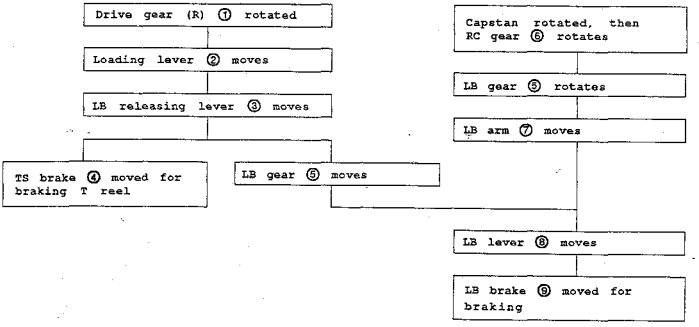


Fig.I-5

2-3 TS Brake, LB Brake


Drive gear (R) ① rotated
Loading lever ② moves
LB releasing lever ③ moves
TS brake ④ moved for braking T reel
LB gear ⑤ moves
Capstan rotated, then RC gear ⑥ rotates
LB gear ⑤ rotates
LB arm ⑦ moves
LB lever ⑧ moves
LB brake ⑨ moved for braking

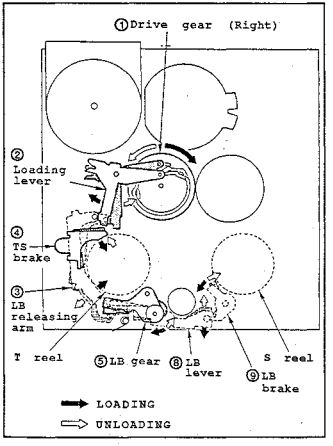


Fig. I-6

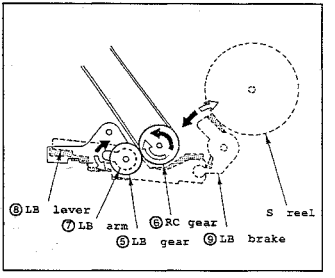


Fig. I-7

2-4 T Brake, S Brake

Drive gear (R) ① rotated

↓

Brake releasing arm ③ moves along cam ②

↓

T brake ④ moves for releasing T reel breaking

↓

S brake ⑤ moved for releasing S reel breaking

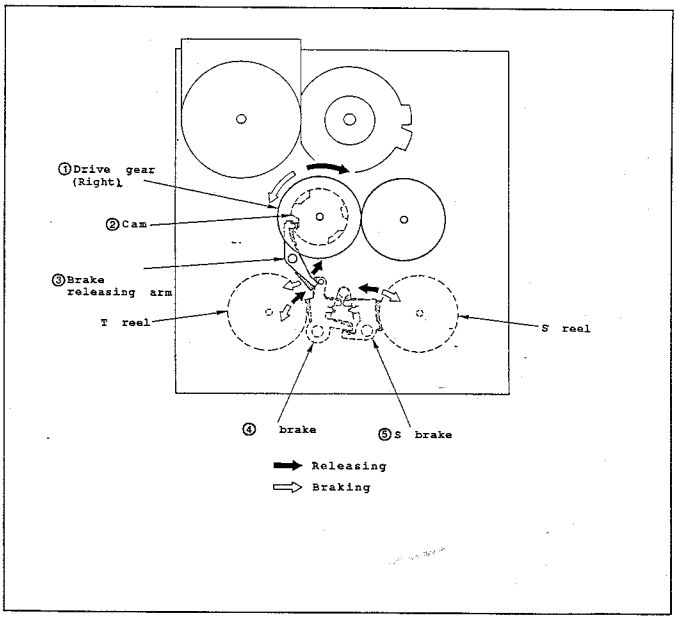
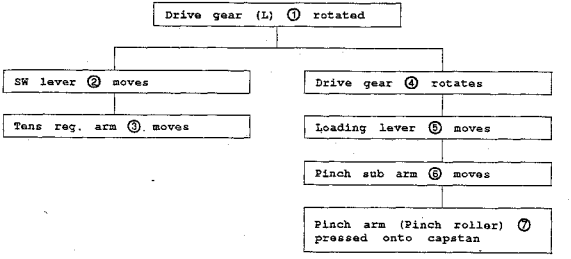


Fig. I-8

2-5 Tension Regulator Arm, Pinch Arm (Pinch Roller)


Drive gear (L) ① rotated
SW lever ② moves
Tens reg. arm ③ moves
Drive gear ④ rotates
Loading lever ⑤ moves
Pinch sub arm ⑥ moves
Pinch arm (Pinch roller) ⑦ pressed onto capstan

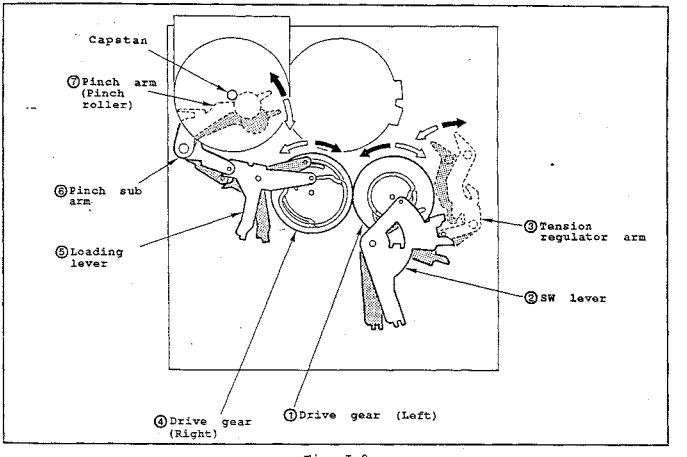


Fig. I-9

2-6 Coasters (Right/Left)

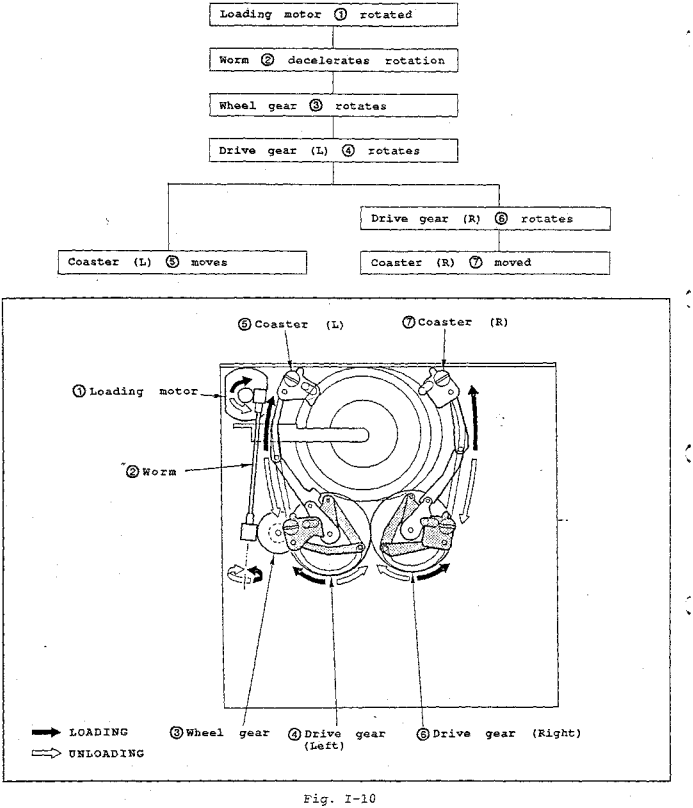
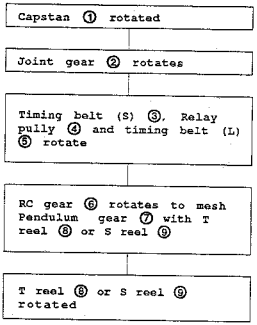


Fig. I-10

2-7 Reel Tables (Take-up/Supply)


Capstan ① rotated
Joint gear ② rotates
Timing belt (S) ③, Relay pully ④ and timing belt (L) ⑤ rotate
RC gear ⑥ rotates to mesh Pendulum gear ⑦ with T reel ⑧ or S reel ⑨
T reel ⑧ or S reel ⑨ rotated

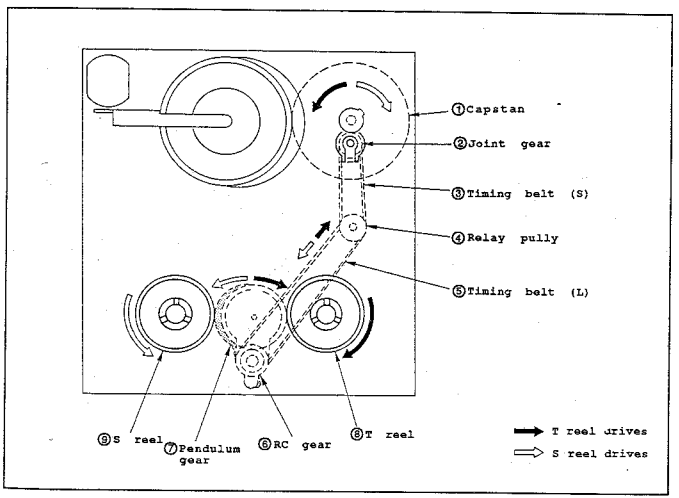


Fig.I-11

3. Each Mode Transition
3-1 Cassette In

Cassette tape is set

Claw ① releases lid locking ②. (By this, Cassette lid becomes openable freely.)

Push cassette comp. ③ toward direction A.

Locking arm ④ moves in direction B to lock cassette compartment ③.

Cassette lid ⑦ opens

Convex part ⑧ released for releasing reel lock. (Tape can be picked up freely.)

Eject lever ⑤ pushed to turn Push SW ⑥ on

Ⓐ

Continued to next page.

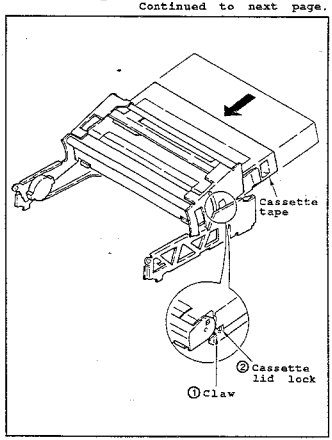


Fig.I-12

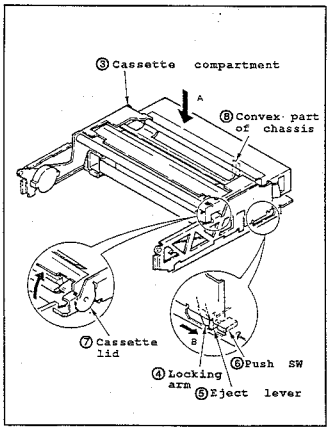
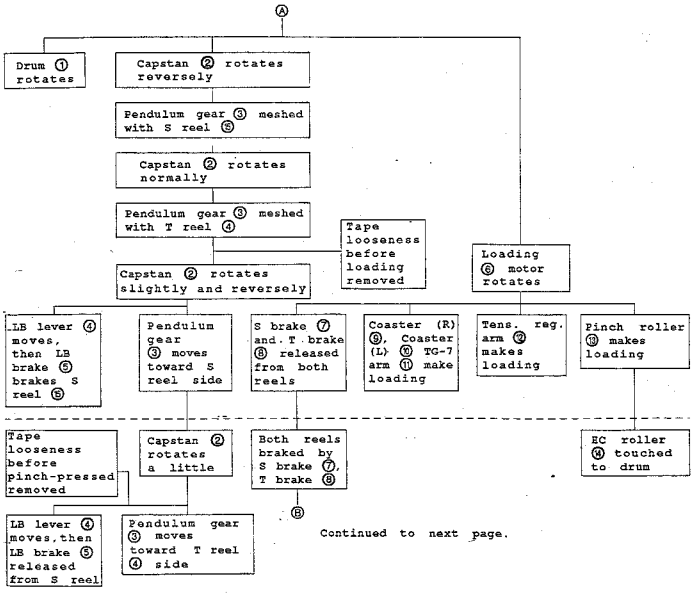


Fig.I-13


Ⓐ
Drum ① rotates
Capstan ② rotates reversely
Pendulum gear ③ meshed with S reel ⑤
Capstan ② rotates normally
Pendulum gear ③ meshed with T reel ④
Capstan ② rotates slightly and reversely
Tape looseness before loading removed
Loading ⑥ motor rotates
LB lever ④ moves, then LB brake ⑤ brakes S reel ⑤
Pendulum gear ③ moves toward S reel side
S brake ⑦ and T brake ⑧ released from both reels
Coaster (R) ⑨, Coaster (L) ⑩ TG-7 arm ⑪ make loading
Tens. reg. arm ⑫ makes loading
Pinch roller ⑬ makes loading
Tape looseness before pinch-pressed removed
Capstan ② rotates a little
Both reels braked by S brake ⑦, T brake ⑧
EC roller ⑭ touched to drum
Ⓑ
LB lever ④ moves, then LB brake ⑤ released from S reel
Pendulum gear ③ moves toward T reel ④ side
Continued to next page.

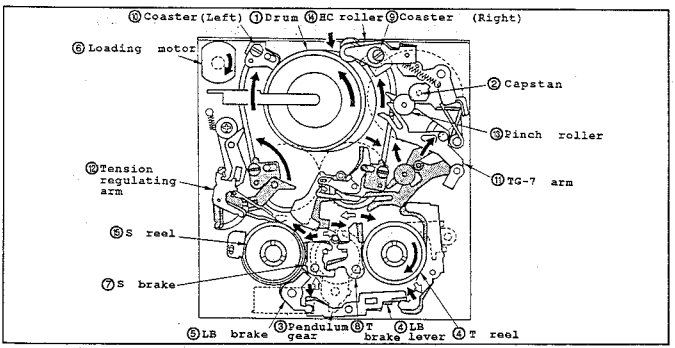
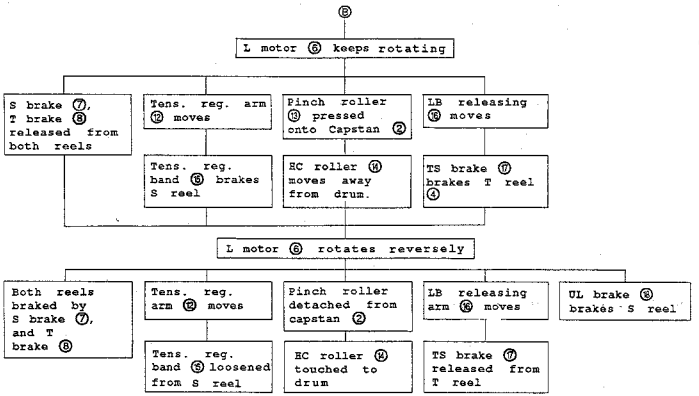

⑩Coaster (Left)
①Drum
⑭EC roller
⑨Coaster (Right)
⑥Loading motor
②Capstan
⑬Pinch roller
⑫Tension regulating arm
⑪TG-7 arm
⑤S reel
⑦S brake
⑤LB brake
③Pendulum gear
⑧T brake
④LB brake lever
④T reel

Fig.I-14


Ⓑ
L motor ⑥ keeps rotating
S brake ⑦, T brake ⑧ released from both reels
Tens. reg. arm ⑫ moves
Pinch roller ⑬ pressed onto Capstan ②
LB releasing ⑮ moves
Tens. reg. band ⑤ brakes S reel
HC roller ⑭ moves away from drum.
TS brake ⑰ brakes T reel ④
L motor ⑥ rotates reversely
Both reels braked by S brake ⑦, and T brake ⑧
Tens. reg. arm ⑫ moves
Pinch roller detached from capstan ②
LB releasing arm ⑮ moves
UL brake ⑨ brakes S reel
Tens. reg. band ⑤ loosened from S reel
HC roller ⑭ touched to drum
TS brake ⑰ released from T reel

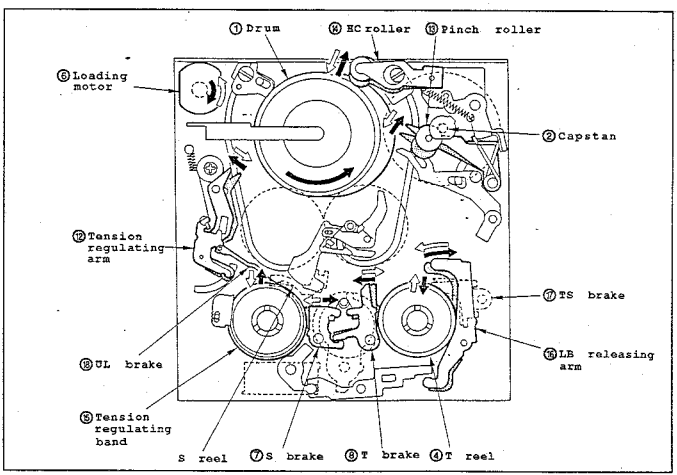
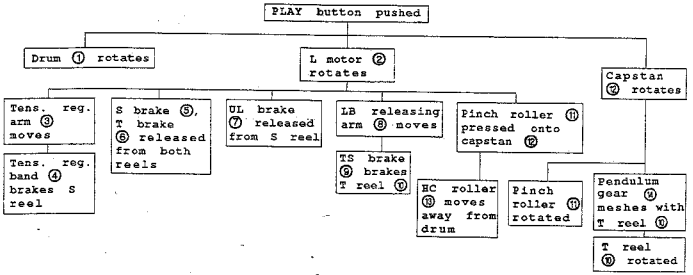

① Drum
⑭ HC roller
⑬ Pinch roller
⑥ Loading motor
② Capstan
⑫ Tension regulating arm
⑰ TS brake
⑮ LB releasing arm
⑨ UL brake
⑤ Tension regulating band
S reel
⑦ S brake
⑧ T brake
④ T reel

Fig.I-15


PLAY button pushed
Drum ① rotates
L motor ② rotates
Capstan ⑫ rotates
Tens. reg. arm ③ moves
Tens. reg. band ④ brakes S reel
S brake ⑤, T brake ⑥ released from both reels
UL brake ⑦ released from S reel
LB releasing arm ⑧ moves
TS brake ⑨ brakes T reel ⑰
Pinch roller ⑪ pressed onto capstan ⑫
HC roller ⑬ moves away from drum
Pinch roller ⑪ rotated
Pendulum gear ⑭ meshes with T reel ⑰
T reel ⑰ rotated

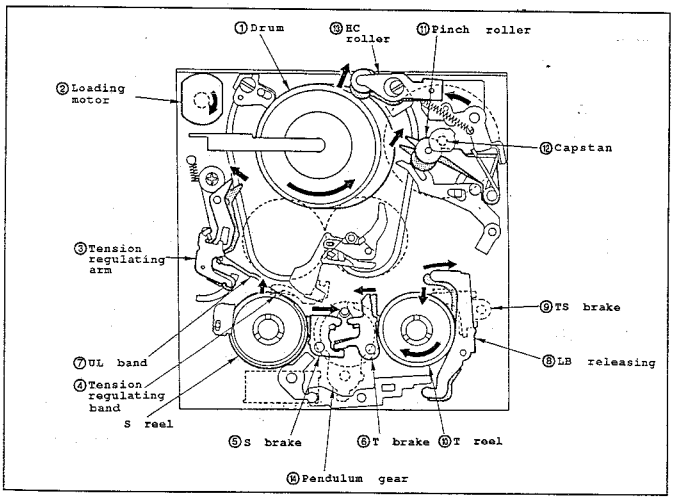

①Drum
⑬HC roller
⑪Pinch roller
②Loading motor
⑫Capstan
③Tension regulating arm
⑨TS brake
⑧LB releasing
⑦UL band
④Tension regulating band
S reel
⑤S brake
⑥T brake
⑰T reel
⑭Pendulum gear

Fig.I-16

3-3 Tape Path

Tape pulled from S reel ①

↓

Tension applied to tape by tens. reg. arm ②

↓

Tape runs along TG-2 roller guide ③

↓

Tape runs along TG-3 ④, then tilted by coaster (L) ⑤

↓

Tape wound on drum ⑥

↓

Tape tilt removed by coaster. (R) ⑦, then runs along TG-6 ⑧

↓

Tape runs between capstan ⑨ and pinch roller ⑩ pressed

↓

Tape runs along TG-7 ⑪

↓

Tape taken up by T reel ⑫

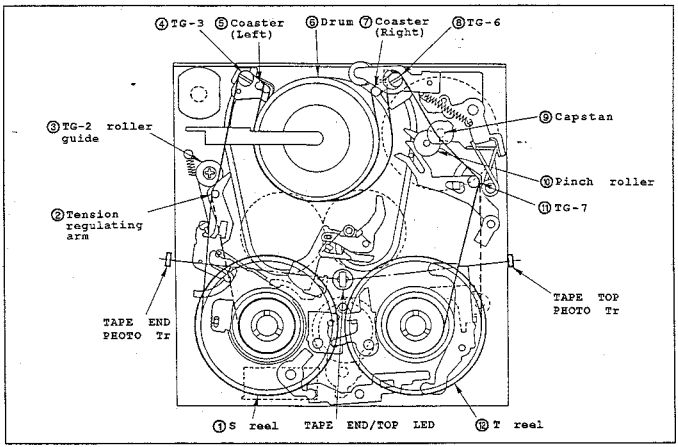


Fig.I-17

PAUSE button pushed at playback

Capstan ① stops

Pendulum gear ② stops

Pinch roller ④ stopped

T reel ③ stopped

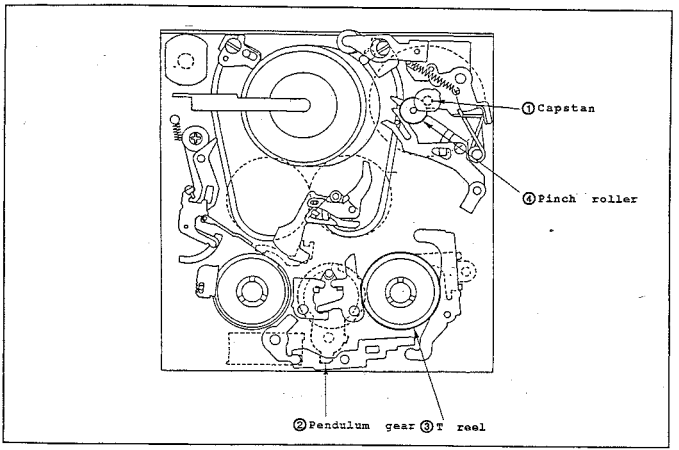


Fig.I-18

FF KEY button pushed at playback

Capstan ① rotates 9 times faster than at playback

Pendulum gear ② rotates at high speed

Pinch roller ④ rotated at high speed

T reel ③ rotated at high speed

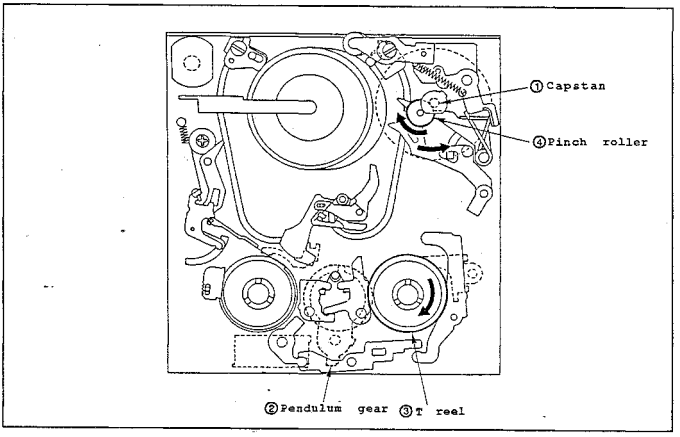


Fig.I-19

REV KEY button pushed at playback

Capstan ① rotates reversely 7 times faster than at playback

Pendulum gear ② moves to be meshed with S reel ③

S reel ③ rotated at high speed

Pinch roller ④ rotated reversely at high speed

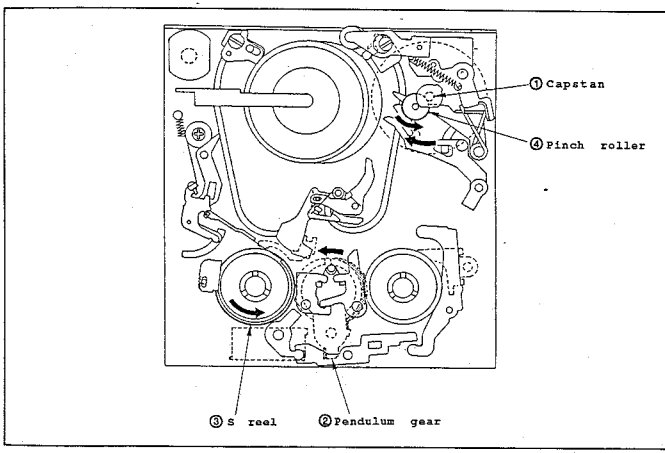
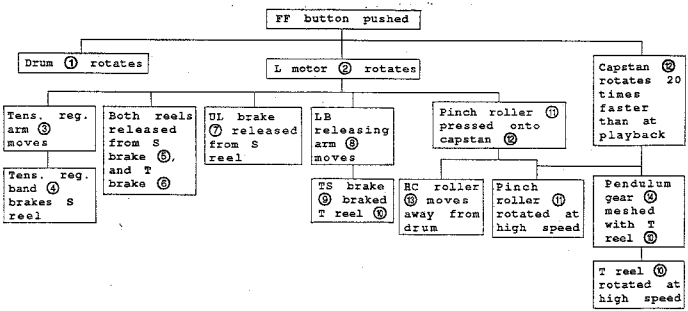


Fig.I-20


FF button pushed
Drum ① rotates
L motor ② rotates
Capstan ⑫ rotates 20 times faster than at playback
Tens. reg. arm ③ moves
Tens. reg. band ④ brakes S reel
Both reels released from S brake ⑤, and T brake ⑥
UL brake ⑦ released from S reel
LB releasing arm ⑧ moves
TS brake ⑨ braked T reel ⑩
Pinch roller ⑪ pressed onto capstan ⑫
HC roller ⑬ moves away from drum
Pinch roller ⑪ rotated at high speed
Pendulum gear ⑭ meshed with T reel ⑩
T reel ⑩ rotated at high speed

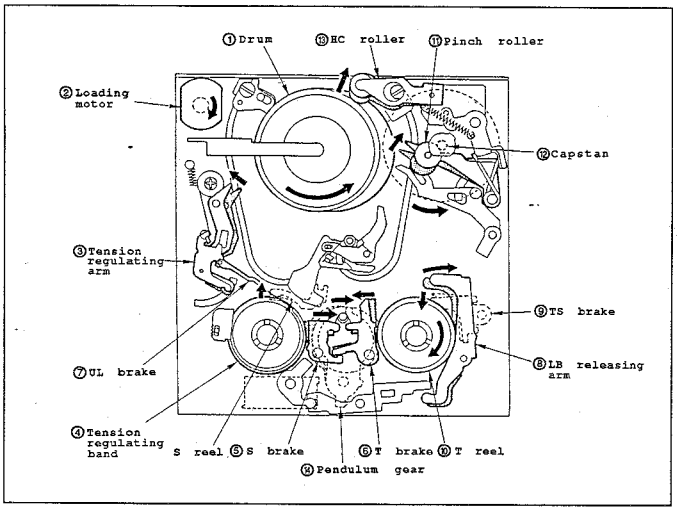

①Drum
⑬HC roller
⑪Pinch roller
②Loading motor
⑫Capstan
③Tension regulating arm
⑨TS brake
⑧LB releasing arm
⑦UL brake
④Tension regulating band
S reel ⑤S brake
⑥T brake ⑩T reel
⑭Pendulum gear

Fig.I-21

REW KEY button pushed

- Drum ① rotates
  - Tens. reg. arm ③ moves
    - Tens. reg. band ④ brakes S reel ⑤
  - Both reels released from S brake ⑥, and T brake ⑦
  - UL brake ⑧ released from S reel ⑤
- L motor ② rotates
  - LB releasing arm ⑨ moves
    - TS brake ⑩ brakes T reel
  - Pinch roller ⑪ pressed onto capstan ⑫
    - EC roller ⑬ moves away from drum
    - Pinch roller ⑪ rotates at high speed
- Capstan ⑫ rotates reversely 20 times faster than at playback
  - Pend. gear ⑭ meshed with T reel ⑮
    - T reel rotated at high speed

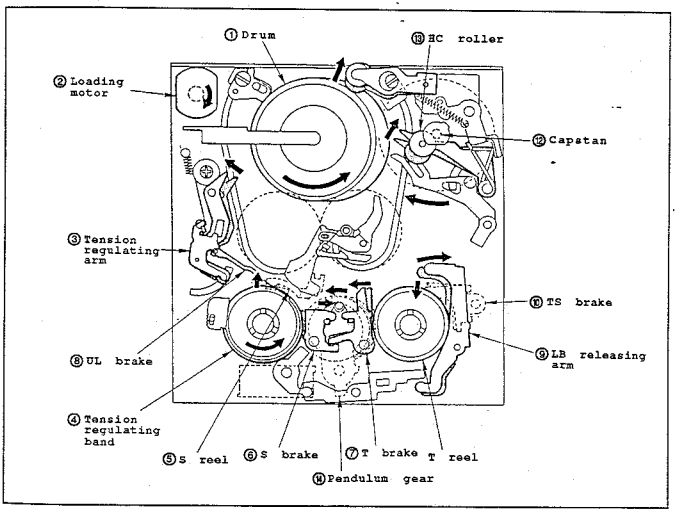
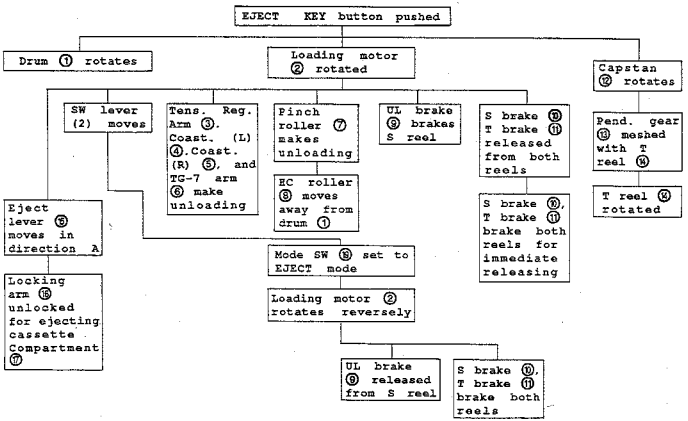


Fig.I-22


EJECT KEY button pushed
Drum ① rotates
Loading motor ② rotated
Capstan ⑫ rotates
SW lever (2) moves
Tens. Reg. Arm ③. Coast. (L) ④.Coast. (R) ⑤, and TG-7 arm ⑥ make unloading
Pinch roller ⑦ makes unloading
UL brake ⑨ brakes S reel
S brake ⑩ T brake ⑪ released from both reels
Pend. gear ⑬ meshed with T reel ⑭
T reel ⑭ rotated
Eject lever ⑮ moves in direction A
EC roller ⑧ moves away from drum ①
S brake ⑩, T brake ⑪ brake both reels for immediate releasing
Mode SW ⑤ set to EJECT mode
Locking arm ⑯ unlocked for ejecting cassette compartment ⑰
Loading motor ② rotates reversely
UL brake ⑨ released from S reel
S brake ⑩, T brake ⑪ brake both reels

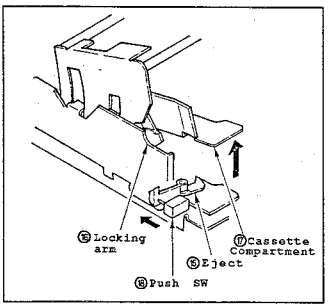

⑯Locking arm
⑰Cassette Compartment
⑮Eject
⑱Push SW

Fig.I-23

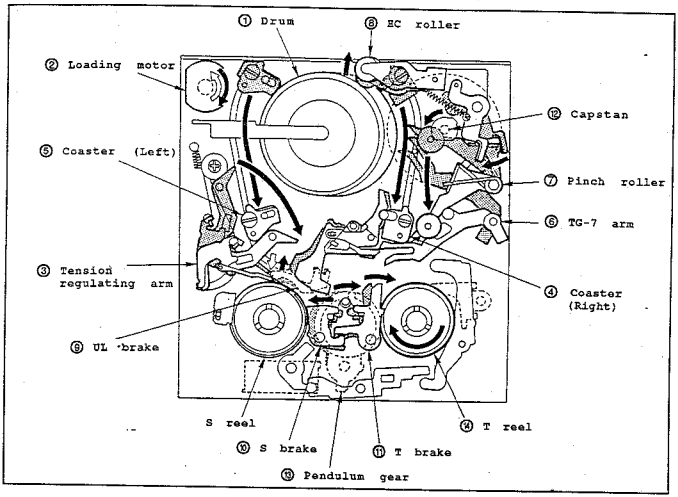

① Drum
⑧ EC roller
② Loading motor
⑫ Capstan
⑤ Coaster (Left)
⑦ Pinch roller
⑥ TG-7 arm
③ Tension regulating arm
④ Coaster (Right)
⑨ UL brake
S reel
⑭ T reel
⑩ S brake
⑪ T brake
⑬ Pendulum gear

Fig.I-24

Chapter 2 Adjustments/Replacement

1. Recorder Section Mechanical Check/Adjustment

*Note: For details, i.e. removal of covers, C.B.A.S, location of test points, etc., refer to the service manual of product which equips this mechanism.

1-1 List of Maintenance Tools and Supplies

Maintenance Tools

Description	Tool No.	Remarks
Cassette Torque Gauge for 8mm	DY9-1047-000	
Alignment Tape K (Tracking B)	DY9-1085-000	New (for NTSC)
Alignment Tape L (Tracking C)	DY9-1086-000	New (for PAL/SECAM)
Hexagonal wrench (0.89mm)		New (Commercially available)
Rotary drum jig kit		Enclosed in repair kit

Supplies

Description	Tool No.	Remarks
Lens Tissue K-1, K-3	CY9-4023-003	Camera Service Dept.
Molyton Grease	DY9-3009-000	
Hydroflud NT-68	DY9-3010-000	*See the note below
Ethyl alcohol		Commercially available

*Note: In U.S.A., contact video service Div., Canon U.S.A., Inc. for ordering.

1-2 Removal of cassette Compartment Assembly (Fig.II-1)

(1) Remove setscrews ① and ②.
(2) To detach cassette compartment assembly, slide the assembly a little toward you. (Ⓐ parts in Fig.II-1 detached)
Then take out the assembly.

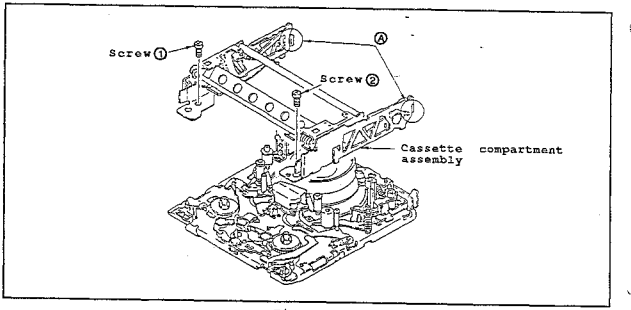


Fig.II-1

1-3 Tape Loading/Play without LS cassette Compartment Assembly and Tape

*Note: Remove a strong light source when performing the followings.
If performed near the strong light source, a tape sensor misoperated.

1-3-1 Loading (Fig.II-2)

(1) Cover a tape sensor LED with an opaque cap ① or equivalent.
(2) To press a pin, attach a tape onto the Recog. switch ②.
(3) Move the Eject lever ③ in the direction of Ⓐ.

1-3-2 Play (Fig. II-2)

(1) Set loading state.
(2) Snap a rubber band ④ around the S and T reels.
(3) To rotate T reel, push the play Key Switch.
When the tape starts moving, push the tension regulating arm ⑤ in the direction of Ⓑ. (At this time, the tension regulating band is released, and the S reel moves.)

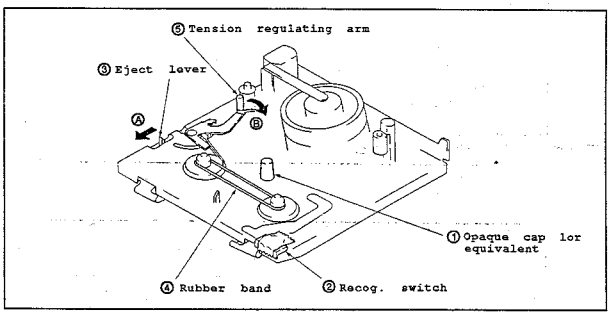


Fig.II-2

1-4 Independent Operation of Mechanism Section

*Note: Perform this operation when the C.B.A.S are removed.

(1) To expose the terminals, remove the tape from the upper part of loading motor. (Fig.II-3)
(2) Supply 3V (approx.) to the terminals of loading motor ① from the constant voltage supplier.
(3) For confirming the mechanical modes, use the output of slide switch ② (mode switch). (Fig.II-4, Table II-1).

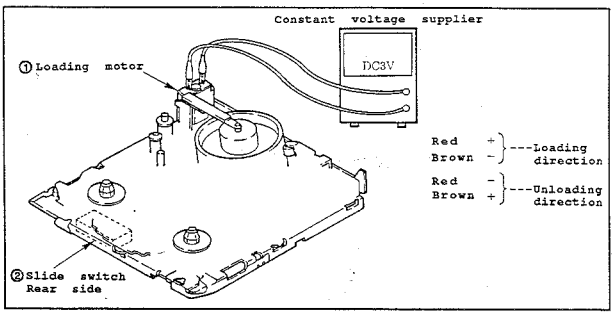


Fig.II-3

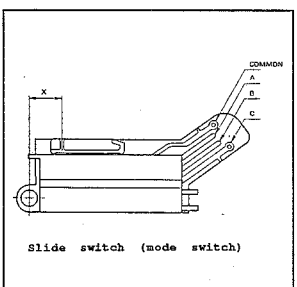


Fig.II-4

Modes	X (mm)	A	B	C
Eject	1.7-2.7	opened	opened	shorted
Blank	2.7-5.7	opened	opened	opened
Load/Unload	5.7-6.7	opened	shorted	shorted
Blank	6.7-8.1	opened	shorted	opened
Stop	8.1-9.1	shorted	shorted	opened
Blank	9.1-12.0	shorted	opened	opened
Play	12.0-13.3	shorted	opened	shorted

Note: "Opened" and "shorted" in the table is versus the COMMON.

Table II-1

2. Periodic Check/Confirmation and Notes for Each Mechanism

To maintain the performances of equipment and tape properly, perform the following checks periodically. Also, after repairing, confirm the followings regardless of the length of use hours.

• Cleaning

2-1 Rotary Drum

(1) Clean the rotary drum gently with a thick lens tissue (CY9-4023-003) with ethyl alcohol wetted.
When cleaning, rotate the rotary drum counterclockwise gradually by hand.

*Notes: 1. Do not rotate the motor by using the power source.
2. Do not rotate the drum clockwise.
3. Do not clean the drum except the above procedure.
If the lens tissue with ethyl alcohol soaked is used vertically to head chip, the head chip may be damaged.

2-2 Tape Path

(1) Clean the tape path (No.1-7 guides, Capstan shaft and Pinch roller) by using a lens tissue with ethyl alcohol soaked. (Fig.II-5)

2-3 Driving System (Timing belt, surface of reel table)

(1) Clean the timing belt and the reel table by using a lens tissue with ethyl alcohol soaked.

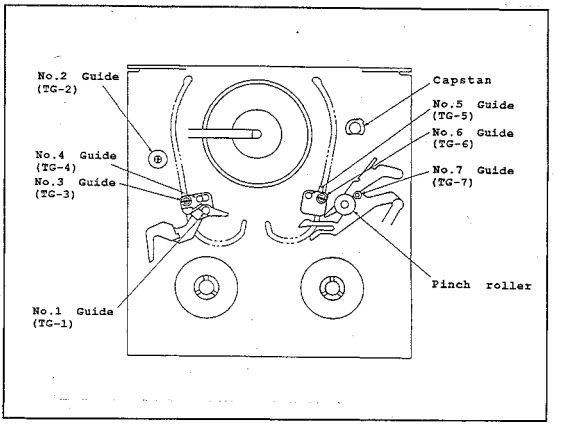


Fig.II-5

2-4 Periodic Check/Confirmation Items

When performing periodical Check/Confirmation, refer to the following items.

Check/Conformation items		Hours of Use (H)									Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Drum/ Tape Path	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful for oil
	Cleaning of rotary drum assembly	○	○	○	○	○	○	○	○	○	○	Be careful for oil
Driving systems	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be absolutely careful not to put oil on the tape path surface.
	Relay pully shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	
Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD.RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

Oil and Grease

(1) "One drop of oil" means the amount which sticks to a 2mm diameter rod, as shown in Fig.II-6.
(2) Use oil and grease specified below.
Molyton grease DY9-3009-000
Hydroflud-NT68 Commercially available (DY9-3010-000).
(3) For a shaft receiver, be sure to use the oil without dust particles, etc. If the oil with such substances used, a shaft receiver may be damaged by friction, etc..

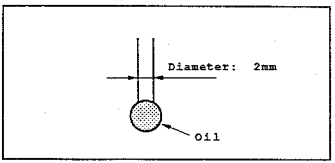


Fig.II-6

3 Disassembling/Adjustment for Mechanical Section

3-1 Roller Assembly

- Disassembling (Fig.II-7)

  (1) To dismount the roller assembly ②, removes a screw ①.

- Reassembling (Fig.II-7)

  (1) Install the roller assembly while aligning the two dowels with the two holes ④ at mechanical chassis.
  (2) Secure the roller assembly ② with a screw ①.

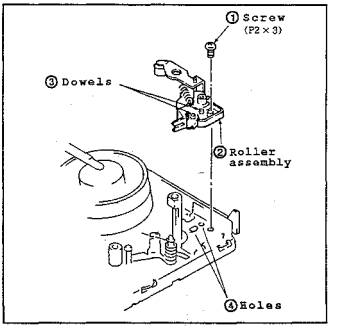


Fig.II-7

3-2 Guide Guard

- Disassembling (Fig.II-8)

  (1) To detach the guide guard, remove a screw ①.

- Reassembling (Fig.II-8)

  (1) Install the guide guard while aligning the dowel ③ with the hole ④.
  (2) Secure the guide guard ② with a screw ①.

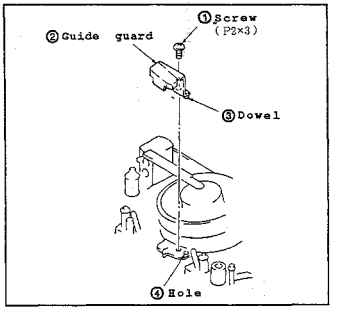


Fig.II-8

3-3 Capstan Motor

- Disassembling (Fig.II-9)

(1) Set the unloading state.
(2) Rotate the stopper ① in direction Ⓐ until it comes to an end.
(3) To take out the capstan motor ③, remove the two set screws ②.

- Reassembling (Fig.II-9)

(1) Align the two dowels ④ with the two holes ⑤ to match the gear section ⑥ with the connecting gear ⑦.
(2) Secure the capstan motor ③ with the two set screws ②.
(3) Rotate the stopper ① in direction of Ⓑ until it comes to an end.

*Notes: 1. Do not match the gear section ⑥ and the connecting gear ⑦ forcibly to prevent the cam grooves damaging.
2. Fit the capstan motor ③ and the chassis without space.
3. Do not touch the capstan motor shaft, the rotor section and the oil seals.

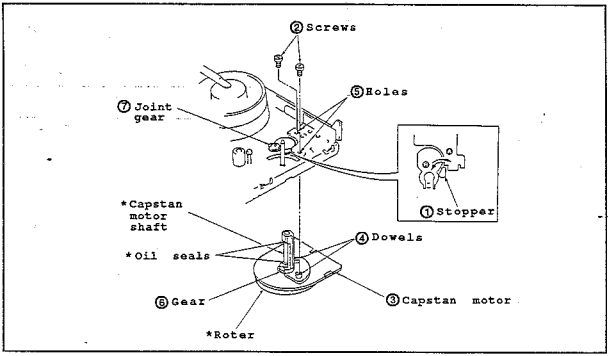


Fig.II-9

3-4 S Brake, T Brake

- Disassembling (Fig.II-10)

(1) Remove the spring ①.
(2) To take out the T brake ③, remove the shaft pin ②.
(3) To take out the S brake ⑤, remove the shaft pin ④.

*Note: If the claw part of shaft pin ② and ④ damaged, replace them.

- Reassembling (Fig.II-10)

(1) Install the S brake ⑤ while inserting the gear ⑥ into the notch ⑦.
(2) Attach the shaft pin ④.
(3) To install T brake ③, put the shaft ⑧ of T brake ③ into the S reel side comparing the brake releasing arm ⑨. At this time, part Ⓐ must be at the drum side comparing part Ⓑ.
(4) Attach the shaft pin ②.
(5) Insert the spring ① under the claw ⑪ of shaft ⑩.
Hook the spring ① on the claws ⑫, respectively.

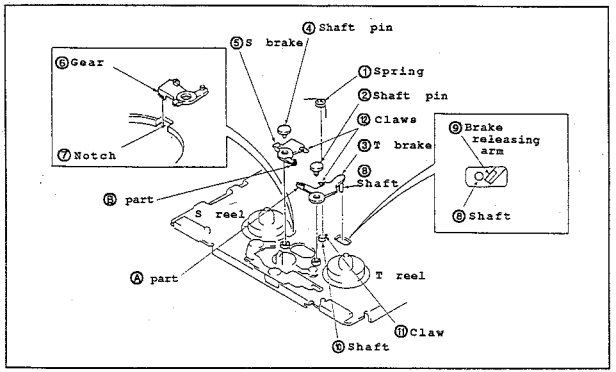


Fig.II-10

3-5 LB Brake, LB Lever

• Disassembling (Fig.II-10)

(1) To take off the TL plate ②, remove the screw ①.
(2) To take off the LB brake ④, remove the shaft pin ③.
(3) To take off the LB lever ⑥, remove the shaft pin ⑤.

*Note: If the claw part of shaft pin ③ and ⑤ damaged, replace them.

• Reassembling (Fig.II-11)

(1) Assemble the LB lever ⑥ while inserting the LB gear pin ⑦ to the hole of LB lever ⑥. Then, secure it with the shaft pin ⑤.
(2) Assemble the LB brake ④ while inserting the pin ⑧ to the notch ⑨ of LB lever ⑥ and the gear ⑩ to the notch ⑪.
(3) Install the shaft pin ③.
(4) Assemble TL plate ② while aligning the dowel ⑫ and the hole ⑬. Then, secure it with the screw ①.

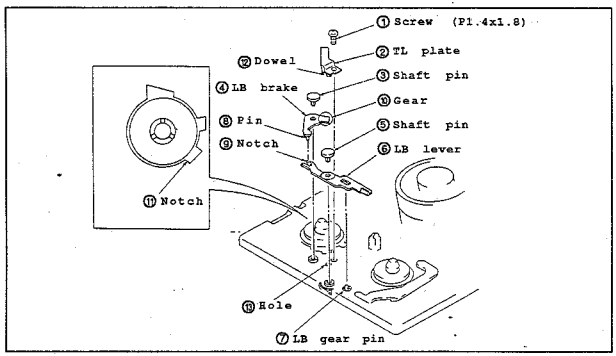


Fig.II-11

3-6 LB Releasing Arm

• Disassembling (Fig.II-12)

(1) Take off the LB releasing arm ② while pushing the claw ① in the arrow direction.

• Reassembling (Fig.II-12)

(1) Install the LB releasing arm ② to the shaft ③ while inserting ⓐ, ⓑ, ⓒ and ⓓ to the holes ④, respectively.
Then, secure it by hooking the claw ①.

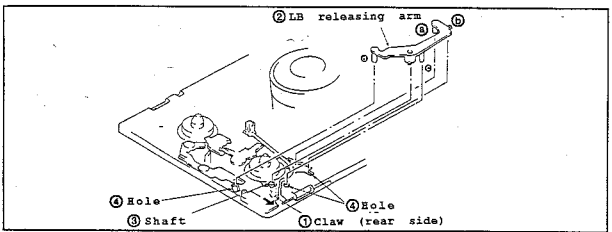


Fig.II-12

3-7 RK Stopper, RK Stopper Arm

• Disassembling (Fig.II-13)

(1) Remove the screw ⑦.
(2) To take off the RK stopper arm ③, unhook the claw ② of chassis.
(3) Take off the RK stopper ④.

• Reassembling (Fig.II-13)

(1) Assemble the RK stopper ④ onto the shaft ⑤.
(2) Assemble RK stopper arm ③ onto the shaft ⑥ while inserting the pin ⑩ to the hole ⑪.
Then, secure it by hooking the claw ② to the hole ⑦.
(3) Install the spring ① to the shaft ⑤.
Then, hook it to the claws ⑧ and ⑨, respectively.

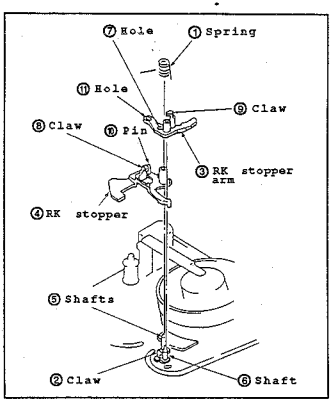


Fig.II-13

3-8 Pinch Arm, TG-7 Arm

• Disassembling (Fig.II-14)

(1) Set the unloading state.
(2) To take off the pinch arm ②, remove the washer ①.
(3) To detach the TG-7 plate spring ⑤, bend the claw ④ of hole ③ by using a thin screwdriver or equivalent.
(4) Detach the TG-7 arm.

• Reassembling (Fig.II-14)

(1) Apply the grease on the inside and the bottom surface of the hole ⑦.
(2) Insert the shaft ⑧ of TG-7 arm ⑥ to the hole ⑦.
(3) Apply the grease on the shadowed area ⑧. (Fig.A)
(4) Insert the TG-7 plate spring ⑤ to the hole ③.
Then, secure it by hooking the claw ④.
(5) Apply the 1/2 drop of oil to the shaft ⑨.(Fig.B)
(6) Insert the pinch arm ② to the shaft ⑨.
Then, assemble while inserting the pinch sub-arm's cut-up part into the ⓑ part.
(7) Secure it with the washer ①.

* Notes: 1. Do not apply the grease on the screw ⑪ of TG-7 arm ⑥. (Fig.A)
2. Be careful for the TG-7 guide and the rubber part when inserting.
3. After reassembled, be sure to perform the tape path adjustment.

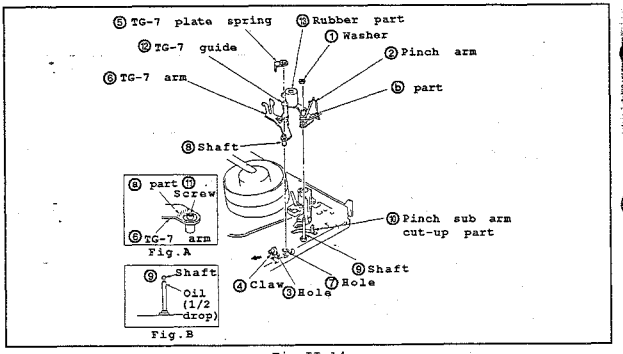


Fig.II-14

3-9 TG-2

• Disassembling (Fig.II-15)

(1) Take out the TG-2 upper flange ①.
(2) Take out the TG-2 roller ②, TG-2 sleeve ③, TG-2 lower flange ④ and the coil spring ⑤.

• Reassembling (Fig.II-15)

(1) Install the coil spring ⑤, TG-2 lower flange ④, TG-2 sleeve ③ and TG-2 roller ② to the shaft.
(2) Secure the TG-2 upper flange ① to the shaft by turning it four to 6 times.

• Presetting (Fig.II-16)

(1) Turn the TG-2 upper flange ① to adjust the height between the mechanical chassis surface and the TG-2 upper flange to 18.6mm.

*Note: After presetting, perform the tape path adjustment.

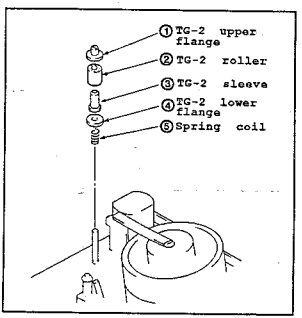


Fig.II-15

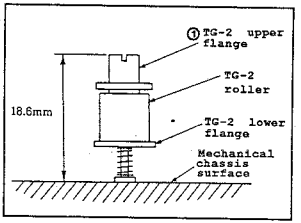


Fig.II-16

3-10 S Reel Table, T Reel Table

• Disassembling (Fig.II-17)

(1) In the same procedures in "3-4", dismount the S and T brake.
(2) In the same procedures in "3-5", detach the TL plate.
(3) In the same procedures in "3-11", take off the tension regulator band.
(4) Dismount the S reel table ①.
(5) Turn the stopper ② in the direction of Ⓐ by 90° approximately.
(6) While shifting the LB releasing arm ③ in the direction of Ⓑ, dismount the T reel table.

• Reassembling (Fig.II-17)

*Caution: When mounting S and T reel tables, be careful not to drop the oil onto the reflection plate at the rear side. If the oil dropped, dust particles may put on and it makes the counter inaccurate.

(1) Apply the 1/2 drop of oil to the shaft ⑤. (Fig.A)
(2) Rotate RK gear ⑥ to the direction of Ⓒ.
Rotate the TS brake ⑦ to the direction of Ⓓ.
(3) While shifting the LB releasing arm ③ to the direction of Ⓑ, mount the T reel table ④ to the shaft ⑤.
Then, turn the stopper ② to the direction of Ⓕ until it comes to an end.
(4) Apply the 1/2 drop of oil to the shaft ⑧. (Fig.B)
(5) Rotate the RK gear ⑥ to the direction of Ⓕ.
Rotate the UL brake ⑨ to the direction of Ⓖ.
Rotate the LB brake ⑩ to the direction of Ⓗ.
(6) Mount the S reel table to the shaft ⑧.
(7) In the same procedures in "3-11", hook up the tension regulator band.
(8) In the same procedures in "3-5", attach the TL plate.
(9) In the same procedures in "3-4", mount the S brake and T brake.

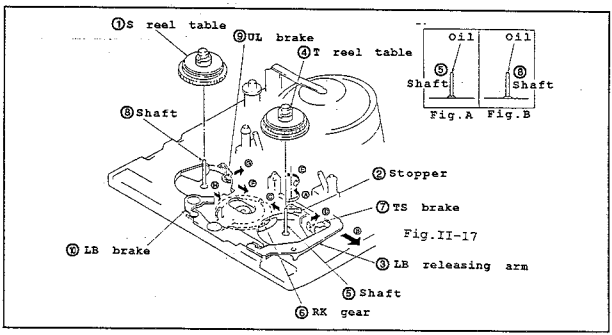


Fig.II-17

Fig.II-17

3-11 Tension Regulator Band/Arm

• Disassembling (Fig.II-18)

(1) In the same procedures in "3-5", detach the TL plate.
(2) Remove the screw ①.
(3) Take off the tension regulator band from the shaft ③ of tension regulator arm ② by using a thin screwdriver or equivalent.
(4) Remove the spring coil ⑤.
(5) Remove the washer ⑥ from the rear side of mechanical chassis. Then, detach the tension regulator arm ②.
(6) To detach the adjust arm ⑧, unhook the claw ⑦.

*Note: When detaching the tension regulator band ④, be careful not to twist or fold it. Also, when detaching it, do not touch the felt side ⑨ and drop the oil.

• Reassembling (Fig.II-18)

(1) Mesh the adjust arm ⑧ with the position indicated in the Fig. A, then, hook the claw ⑦.
(2) Apply the 1/2 drop of oil to the hole ⑩.
(3) Attach the tension regulator arm ② to the slot ⑪ while inserting ⓐ part inside of switch lever a'ssy. (Ⓐ indicated by an arrow.) (Fig.B)
(4) While pressing the tension regulator arm ② from the front side of chassis, secure it with a washer ⑥ from the rear side.
(5) Hook the spring coil ⑤ to the adjust arm ⑧ and the tension regulator arm ②, respectively. The direction of coil is as indicated in the Fig.
(6) Attach the tension regulator band ④ to the shaft ③ of the tension regulator arm ② while fitting the felt side ⑨ onto the shadow area of S reel table ⑫.
(7) Assemble the tension regulator plate ⑬ of the tension regulator band ④ while aligning it with the dowel ⑭ of chassis. Then, secure it with the screw ①.
(8) In the same procedures in "3-5", attach the TL plate.
(9) In the same procedures in "3-21", perform the tension regulator adjustment.
(10) In the same procedures in "3-22", perform the back tension adjustment.

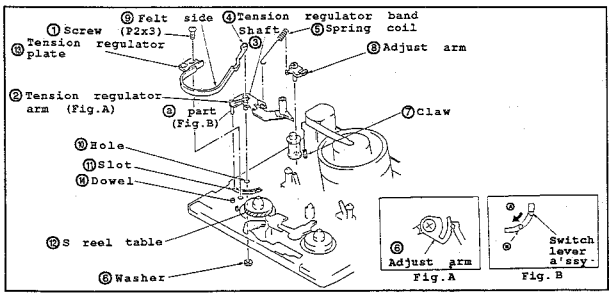


Fig.II-18

3-12 Drum Unit, Dew Sensor

- Disassembling (Fig.II-19)

(1) Set unloading state.
(2) Unplug the flexible connector ① and the connectors ②.
(3) In the same procedures in "3-2", detach the guide guard.
(4) To detach the earth terminal ④, remove the screw ③.
(5) To dismount the drum ⑥ from the chassis, remove the three setscrews ⑤.
(6) Disconnect the connector ⑩.
(7) To detach the dew sensor ⑧, remove the screw ⑦.

- Reassembling (Fig.II-19)

(1) Mesh the ⑧ part of dew sensor ⑧ with the notch ⑪. Then, secure them with the screw ⑦.
(2) Attach the connector ⑩.
(3) Put the harness ⑮ of dew sensor ⑧ under the claw ⑯. (Fig.A)
(4) Insert the connectors ② and the flexible connector ① into the chassis' hole ⑫.
Then, mount the drum while aligning the dowels ⑬, and secure it with the screws ⑤.
(5) While aligning the earth terminal ④ with the chassis' two dowels ⑭, secure it with the screw ③.
(6) In the same procedures in "3-2", attach the guide guard.
(7) Attach two connectors ② and the flexible connector ① to the C.B.A..

*Notes: 1. Be careful not to flaw the head chip ⑨ and the tape path surface of drum ⑥.
2. After reassembling, perform the tape path adjustment.

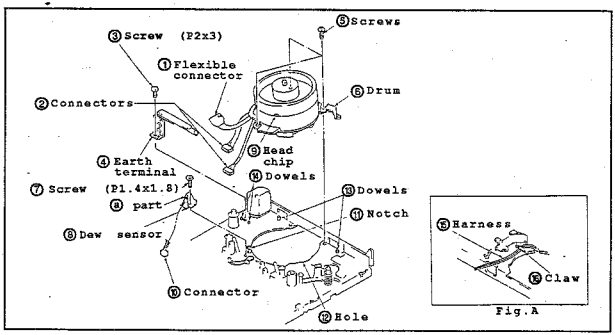


Fig.II-19

3-13 Eject Lever, Switch Lever, Pinch Sub Arm

• Disassembling (Fig.II-20)

(1) Set unloading state.
(2) In the same procedures in "3-3", dismount the capstan motor.
(3) To dismount the eject lever ②, unhook the claw ①.
(4) To detach the switch lever ④, remove the washer ③.
(5) Remove the spring ⑤.
(6) To detach the pinch sub arm ⑦, remove the washer ⑥.

• Reassembling (Fig.II-20)

(1) Apply the grease onto the shaft ⑧. (Fig.A)
(2) Assemble the pinch sub arm ⑦ while inserting the ⓐ part into the slot ⑨.
(3) Secure it with the washer ⑥.
(4) Hook the ⓑ part of spring ⑤ between the claw ⑫ and the chassis side while hooking ⓒ part to the claw ⑫.
(5) Apply 1/2 drop of oil to the shaft ⑬. (Fig.B)
(6) Assemble the switch lever ④ to the shaft ⑬ while aligning the groove ⑭ with the projection ⑮ of mode switch. At this time, insert the pin ⑯ to the outside groove ⑰ of drive gear (left) ⑰.
(7) Secure it with a washer ③.
(8) Attach the eject lever ② and hook the claw ①.
(9) In the same procedures in "3-3", mount the capstan motor.

*Note: When installing the switch lever ④ to the shaft ⑬, set the pin ⑱ of tension regulator arm to the inside of switch lever ④. (within the extent of Ⓐ indicated by an arrow.)

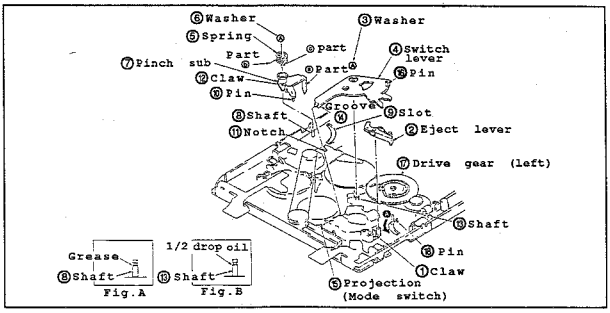


Fig.II-20

3-14 Timing Belt (L), RC Gear, Loading Lever, Timing Belt(S), Joint Gear

• Disassembling (Fig.II-21)

(1) Set unloading state
(2) In the same procedures in "3-3", dismount the capstan motor.
(3) In the same procedures in "3-13", detach the pinch sub arm.
(4) Remove the washer ①. Then dismount the RC gear ② (with the timing belt (L) ③ hooked) from the shaft ④.
(5) Remove the washer ⑥. Then, detach the loading lever ⑧ while pushing the claw ⑦ toward the direction Ⓐ.
(6) Turn the stopper ⑨ toward the direction Ⓑ by 90°.
(7) Detach the joint gear ⑪ (with the timing belt(S) ⑩ hooked) from the shaft ⑮.
(8) Separate the timing belt(S) ⑩ from the relay pully ⑤.

*Note: When dismounting the gear ⑪, do not touch the flange ⓑ part. (Fig.D)

• Reassembling (Fig.II-21)

(1) Apply 1/2 drop of oil to the shaft ⑯. (Fig.F)
(2) Hook the timing belt(S) ⑩ to the joint gear ⑪, and then to the gear ⓓ of relay pully ⑤ (Fig.E).
(3) Attach the joint gear ⑪ to the shaft ⑯ with the timing belt(S) ⑩ attached.
(4) Turn the stopper ⑨ toward the ⓒ direction until it comes to an end.
(5) Apply 1/2 drop of oil to the shaft ⑫. (Fig.A)
(6) Insert the loading lever ⑧ into the shaft ⑫. Then, match the ⑧ part with the claw ⑦ and insert the pin ⑬ into the groove of drive gear (right) ⑭.
(7) Secure the washer ⑥.
(8) Hook the timing belt(L) ③ to the gear as indicated in the Fig.B, and to the gear Ⓒ of the relay pully ⑤. (Fig.E)
(9) Mount the RC gear ② to the shaft ④ (with the timing belt(L) ③ attached). Then, mesh it with the RK gear ⑮.
(10) Secure the washer ①.
(11) Apply the grease to the position of loading lever ⑧ as indicated in Fig.C.
(12) In the same procedures "3-14" and "3-3", assemble the pinch sub arm and the capstan motor.

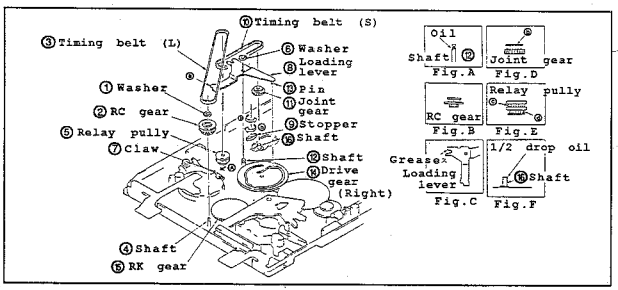


Fig.II-21

3-15 Relay Pully, TS Brake, LB Gear, RK Gear

• Disassembling (Fig.II-22)

(1) Set unloading state.
(2) In the same procedures in "3-3", dismount the capstan motor.
(3) In the same procedures in "3-13", detach the switch lever.
(4) In the same procedures in "3-14", detach the timing belt(L), the RC gear, the loading lever, the timing belt (S) and the joint gear.
(5) To take off the relay pully ②, remove the washer ①.
(6) To detach the TS brake ④, unhook the claw ③.
(7) Remove the spring ⑤.
(8) To detach the LB gear ⑦, remove the washer ⑥.
(9) Detach the RK gear ⑧.

*Note: When taking off the relay pully ②, do not touch the flange part ⓐ. (Fig.C)

• Reassembling (Fig.II-22)

(1) Apply the 1/2 drop of oil to the shaft ⑨. (Fig.A)
(2) Install the RK gear ⑧ to the shaft ⑨ longitudinally.
(3) Apply the 1/2 drop of oil to the shaft ⑩. (Fig.B)
(4) Install the LB gear ⑦ to the shaft ⑩. Then secure it with the washer ⑥.
(5) Put the spring into the shaft ⑪. Then, hook it to the notch ⑫, and cut-up part ⑬.
(6) Assemble the TS brake ④, and hook the claw ③.
(7) Apply the 1/2 drop of oil to the shaft ④. (Fig.D)
(8) Attach the relay pully ② to the shaft ⑭, and secure it with the washer ①.
(9) In the same procedures in "3-14", attach the timing belt(L), the RC gear, the loading lever, the timing belt(S) and the joint gear.
(10) In the same procedures in "3-13" and "3-3", install the switch lever and the capstan motor.

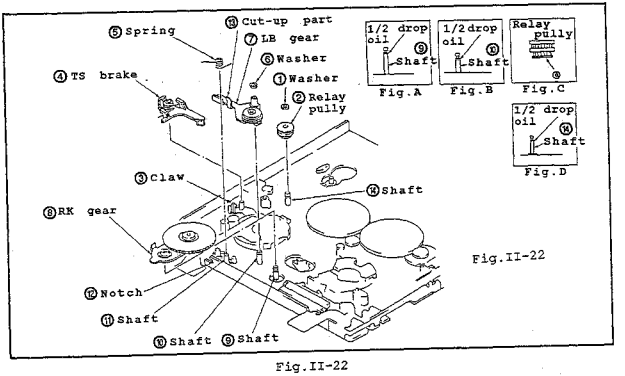


Fig.II-22

Fig.II-22

3-16 UL Gear, UL Brake, UL Arm, LB Plate spring

• Disassembling (Fig.II-23)

(1) In the same procedure in "3-13", detach the switch lever.
(2) To take off the UL gear ②, remove the washer ①.
(3) Detach the UL arm ③, the washer ④ and the LB plate spring ⑤.
(4) Take off the UL brake ⑥.

• Reassembling (Fig.II-23)

(1) Install the UL brake ⑥.
(2) Apply the 1/2 drop of oil to the shaft ⑦. (Fig. A)
(3) As shown in the Fig.B, attach the LB plate spring ⑤ to the shaft ⑦. Then, attach the washer ④.
(4) While matching the projection ⑧ with the groove ⑨ of UL brake ⑥, install UL arm ③ to the shaft ⑦.
(5) Attach the UL gear ② to the shaft ⑦. Then, mesh it with drive gear (left) ⑩.
(6) Secure it with the washer ①.
(7) In the same procedures in "3-13", install the switch lever.

*Note: To prevent the LB plate spring ⑤ damaging, do not secure the washer ① forcibly.

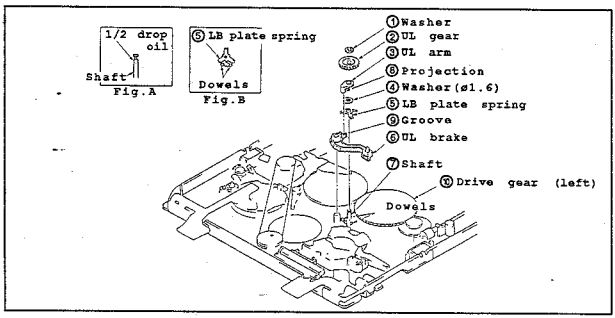


Fig.II-23

3-17 Coaster (Right), Drive Gear (Right)

- Disassembling (Fig.II-24)

(1) In the same procedures "3-3" and "3-12", dismount the capstan motor and the drum unit.
(2) In the same procedures in "3-14", take off the loading lever.
(3) Set STOP mode.
(4) To take off the coaster plate spring ② and the coaster (Right) ③, remove the screw ①.
(5) To detach the plate TT ⑤, remove the two screws ④.
(6) To dismount the drive gear (Right) ⑧, remove the washer ⑥ (ø1.5).

- Reassembling (Fig.II-24)

*Caution: Do not turn the tilt adjusting screw Ⓒ of coaster (Right). (Repair parts have been already adjusted.)

(1) Apply the grease to the indicated positions of chassis as shown in Fig.A.
(2) Apply the 1/2 drop of oil to the shaft ⑧. (Fig.F)
(3) Apply the grease onto the pin ⑨, the shaft ⑩ and the dowel ⑮ of coaster (Right) ③.
(4) Assemble the pin ⑨ and the shaft ⑩ aligning the slot ⑪ of chassis.
(5) Put the brake releasing arm ⑫ to the arrowed direction Ⓐ.
(6) Install the drive gear (Right) ⑦ to the shaft ⑧. Then. mesh it with the drive gear (Left) ⑬ while aligning each phases as shown in Fig.B.
(7) Align ⓐ with ⓑ, the hole ⑭ with the pin ⑨ of coaster (Right) ③, respectively.
(8) Secure the washer ⑥ (ø1.5).
(9) Assemble the coaster plate spring ② while aligning the shaft ⑩ (coaster ③) with the pin ⑨. Then, secure it with the screw ①.. (Torque: 500g/cm approx).
(10) Assemble the plate TT ⑤ aligning with the dowel ⑮. Then, secure it with the two screws ④ in numerical order.
(11) Apply the grease to the positions indicated in the Fig.C and E.
(12) In the same procedures in "3-14", install the loading lever.
(13) In the same procedures in "3-12" and "3-3", mount the drum unit and the capstan motor.

*Note: After reassembling, perform the tape path adjustment.

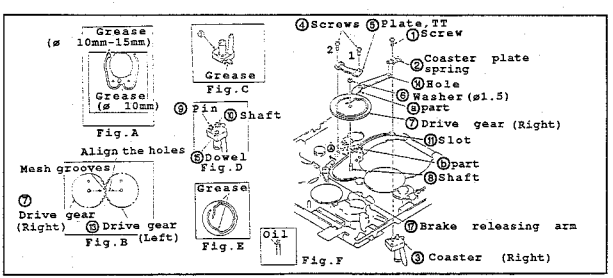


Fig.II-24

3-18 Coaster (Left), Drive Gear (Left)

• Disassembling (Fig.II-25)

(1) In the same procedures in "3-3" and "3-12", dismount the capstan motor and the drum unit.
(2) In the same procedures in "3-13" and "3-14", detach the switch lever, and the loading lever.
(3) In the same procedures in "3-17", detach the coaster (Right) and the drive gear (Right).
(4) To take off the coaster plate spring ② and the coaster (left) ③, remove the screw ①.
(5) To detach the plate SS ⑤, remove the two set screws ④.
(6) To take off the drive gear (Left) ⑦, remove the washer ⑥ (ø1.5).

• Reassembling (Fig.II-25)

(1) Apply the grease onto the indicated positions of chassis in the Fig.A.
(2) Apply the 1/2 drop of oil onto the shaft ⑧. (Fig.E)
(3) Apply the grease onto the pin ⑨, the shaft ⑩ and the dowel ⑮ of coaster (Left) ③. (Fig.B)
(4) Assemble the pin ⑨ and the shaft ⑩ aligning the slot ⑪.
(5) Insert the driver gear (Left) ⑦ into the shaft ⑧ while meshing with the wheel gear ⑫ and the UL gear ⑬.
(6) Align ⑭ part with the slot ⑪, and the hole ⑭ with the pin ⑨ of coaster (Left) ③.
(7) Secure it with the washer ⑥ (ø1.5).
(8) Install the coaster plate spring ② while aligning the shaft ⑩ and the pin ⑨ of coaster (Left) ③. Then, secure it with the screw ①. (Torque: 500g/cm, approx)
(9) Attach the plate SS ⑤ while aligning with the dowel ⑮. Then, secure it the two screws ④ in numerical order.
(10) Apply the grease onto the positions indicated in the Fig.C and D.
(11) In the same procedures in "3-17", install the coaster (Right) and the drive gear (Right).
(12) In the same procedures in "3-14" and "3-13" install the loading lever and the switch lever.
(13) In the same procedures in "3-12" and "3-3", install the drum unit and the capstan motor.

*Note: After reassembling, perform the tape path adjustment.

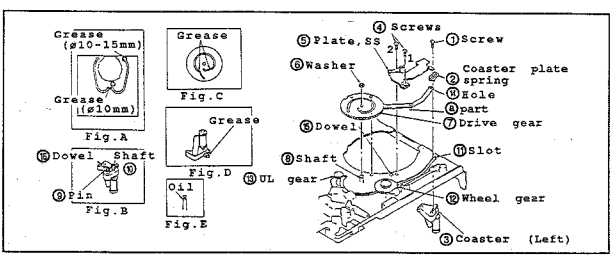


Fig.II-25

3-19 Loading Motor, Worm Assembly, Wheel Gear, Brake Releasing Arm

- Disassembling (Fig.II-26)

(1) In the same procedures in "3-3" and "3-13", dismount the capstan motor and the switch lever.
(2) In the same procedures in "3-14", detach the loading lever.
(3) In the same procedures in "3-17" and "3-18", detach the drive gears (Right) and (Left).
(4) To dismount the loading motor ②, remove the two screws ①.
(5) Take off the brake releasing arm ③.
(6) To take off the wheel gear ⑤, remove the washer ④.
(7) Unhook the six claws ⑦ of worm a'ssy..

- Reassembling (Fig.II-26)

(1) Install the worm a'ssy ⑥ while hooking the six claws ⑦.
(2) Apply the grease to the five shadow areas of worm a'ssy indicated in the Fig.A.
(3) Apply the 1/2 drop of oil to the shaft ⑧. (Fig.B)
(4) Insert the wheel gear ⑤ into the shaft ⑧, and mesh it with the worm a'ssy's gear.
(5) Assemble the brake releasing arm ③.
(6) Apply the grease onto the entire surface of loading motor gear part.
(7) Align the loading motor ② with the chassis. Then, secure them with the two screws ②.
(8) In the same procedures in "3-18" and "3-17", install the drive gears (Left) and (Right).
(9) In the same procedures in "3-14", install the loading lever.
(10) In the same procedures in "3-13" and "3-3", install the switch lever and the capstan motor.

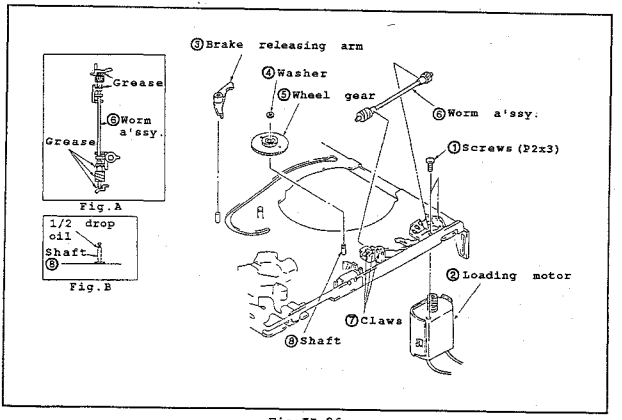


Fig.II-26

3-20 Rotary Upper Drum

- Disassembling

Note: If recordable, perform recording before disassembling.

(1) Unsolder three solderings ⓐ. Then, confirm that the terminals which come out from the hole of C.B.A. can be moved freely. (Fig.II-27)
(2) Remove the two setscrews ①.
(3) Secure the jig ④ to the drum with the two setscrews ②. (Setscrews supplied with jig ④ as a set.) Then, screw in the hexagonal bolt ③ into the hole of jig ④ to dismount the rotary upper drum ⑤. (Fig.II-28)

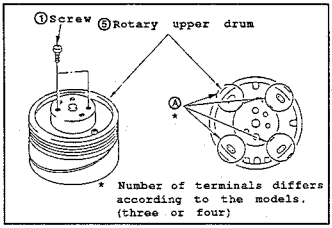


Fig.II-27

- Reassembling

(1) Clean the flange surface and the rotary upper drum ⑤ surface which faced the flange surface. Check that there is no dust particles and flaws.
(2) Insert the jig ⑦ into the drum positioning holes of upper/lower rotary drum. (Fig.II-29)

*Note: At this time confirm that the terminals ⑧ come out from the holes of the rotary upper drum C.B.A..

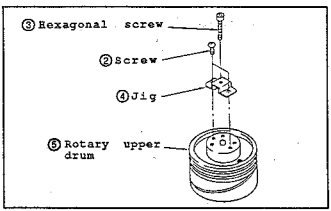


Fig.II-28

(3) Pull out the jig ⑦, and then push the rotary upper drum ⑤ into the lower one manually and gently. If it cannot be set completely to the bottom, Tighten the two setscrews ① alternately and temporarily. (Fig.II-27)
(4) Insert the jig ⑦ into the positioning holes ⑥ again. If it cannot be inserted smoothly, loosen the two setscrews ①. Then perform the step (3) of disassembling procedure.
(5) Tighten the two setscrews ① thoroughly.
(6) Solder the terminals ⓐ. (Fig.II-27)

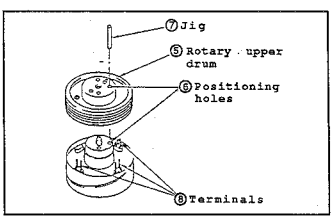


Fig.II-29

*Notes: 1. When soldering, be careful not to let the solder flow to the C.B.A..
2. After reassembling, perform the tape path adjustment.

3-21 Tension Regulator Position Adjustment (Fig.II-30)

(1) Set the cassette tape, and set it to PLAY mode.
(2) Check that the distance between ③ part of tension regulating arm ① and the groove ② of chassis is within 1.1 ± 0.3mm. If it is not the specified distance, perform the following adjustment (from step (3)) without the cassette tape.
(3) Loosen the screw ④ of tension regulating plate ⑤.
(4) If the distance measured in step (2) is more than specified, slide the plate ⑤ in the direction of arrow Ⓐ. If it is less than the specified slide it in the direction of arrow Ⓑ. After sliding, secure it with the screw ④.
(5) For checking, perform the steps (1) and (2).

*Notes: 1. Use the cassette tape which is forwarded to about the middle section.
2. The trail of left coaster on the groove ② of chassis: 1.1mm(approx.)

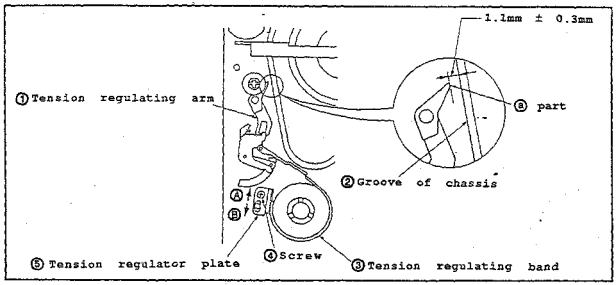


Fig.II-30

3-22 Back Tension Adjustment (Fig.II-31)

(1) Set the cassette torque gauge (DY9-1047-000)
(2) Set PLAY mode.
Confirm that the torque at S reel table is 9-13 g/cm.
(3) If not, adjust the adjust arm ①.

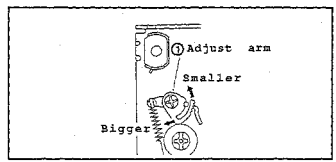


Fig.II-31

3-23 T Reel Table Torque Check

(1) Set the cassette torque gauge (DY9-1047-000)
(2) Set PLAY mode.
Confirm that the torque at T reel table is 7-15 g/cm.
(3) Set REV mode.
Confirm that the torque at T reel table is 13-25 g/cm.

4. Tape Path Adjustment

(Notes for No.7 Guide only)

As the height adjusting screw for No.7 guide is located apart from the No.7 guide . So, to adjust the No.7 guide while watching the state of tape, modify the cassette tape as shown in the Fig.II-32.

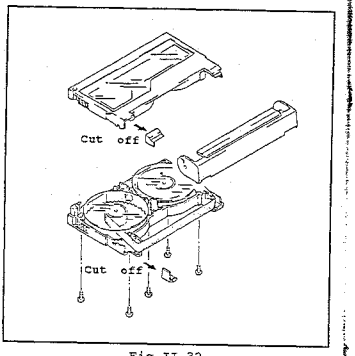


Fig.II-32

4-1 Preparation for Adjustment

*Caution: 1. Do not turn the tilt adjusting screw of the coaster (Right). Replace it if any adjustments required.The repair parts have been already adjusted.

(1) Clean the tape running surface.
(2) Referring to the service manuals for each system, observe the RF envelope signal and RF switching pulse on oscilloscope.
(3) Playback the Alignment tape for tracking.
(4) Confirm that the waveform at inlet and outlet sides are flat. If not, perform the following adjustments from page 46.

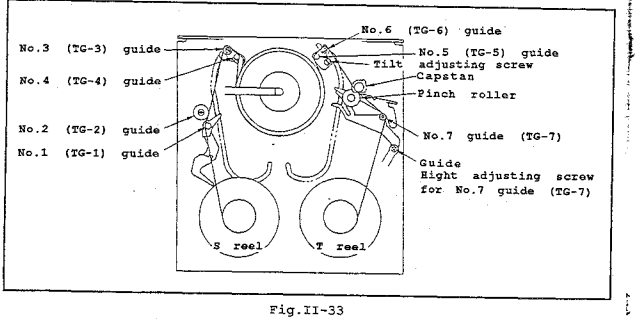


Fig.II-33

4-2 Tracking Adjustment (Fig.II-34)

(1) Playback Alignment tape for tracking adjustment.
(2) Loosen the screw ② a little by inserting a hexagonal wrench (0.89mm) or equivalent into the hole ①.
Then, turn the No.3 guide ③ to make the waveform at inlet side flat.
(3) Loosen the screw ⑤ a little by inserting a hexagonal wrench (0.89mm) or equivalent into the hole ④.
Then, turn the No.6 guide ⑥ to make the waveform at outlet side flat.

*Note: Be careful not to loosen the screws too much because the guide will be easily moved.

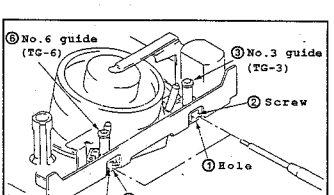


Fig.II-34

4-3 Tracking Fine Adjustment (Fig.II-35)

(1) Referring to the service manuals for each system, set it to the track shift made.(70 %)
(2) Confirm that the waveform is flat. If not, turn No.3 and 6 guides to make it flat.
(3) Tighten the screw ② of No.3 guide to lock it. At this time, confirm that the inlet side of waveform is not changed. (Fig.II-34)
(4) Tighten the screw ⑤ of No.6 guide to lock it. At this time, confirm that the outlet side of waveform is not changed. (Fig.II-34)

*Note: Torque at Screws ②, ⑤: 200g/cm approx.

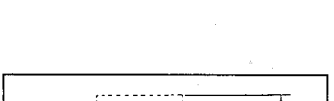


Fig.II-35

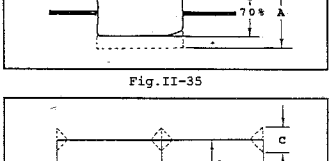


Fig.II-36

4-4 No.2 Guide Adjustment

*Note: When turning or replacing the No.2 guide, perform the following preset procedures before adjustment.

4-4-1 No.2 Guide Presetting

• To preset, adjust the distance between the surfaces of mechanical chassis and TG2 upper flange ① to 18.6 mm by turning TG2 upper flange ①.

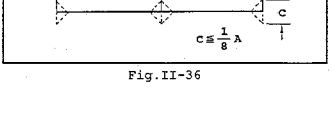


Fig.II-37

4-4-2 No.2 Guide Adjustment (Fig.II-38, 39)

(1) Playback the tape having 10μm in thickness (P6-120 etc.). Then, set it to REV mode.
(2) Confirm that the tape is not creased at the lower flange ② of No.2 guide ①. If creased, turn the upper flange ③ of No.2 guide ① clockwise until the crease removed.
(3) Playback the Alignment tape for tracking adjustment.
(4) In the same procedures in "4-2" and "4-3", perform the tracking and tracking fine adjustments.
(5) At track shift mode, playback the tape after CUE/REV mode. Confirm that the RF envelope rises horizontally within 2 sec as shown in Fig.II-40.
(6) If not, turn the upper flange ③ of No.2 guide ① counter clockwise by 90°. Then, perform the step (5) again.

Repeat the steps (5) and (6) until the normal waveform as specified is obtained. When the RF envelope changed at this time, perform the tracking fine adjustment for inlet side. Then, perform the step (5).

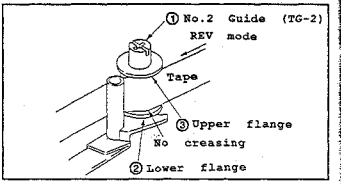


Fig.II-38

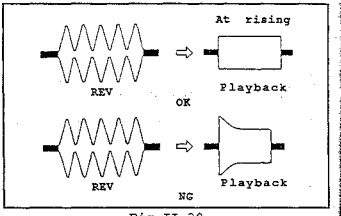


Fig.II-39

4-5 No.7 Guide Adjustment (Fig.II-40)

(1) Playback the tape having 10μm in thickness (P6-120,etc.). Then, set it to REV mode.
(2) Confirm that the tape between the No.6 guide ① and the capstan ② is not loosened. If loosened, turn the height adjusting screw ④ of No.7 guide ③ to remove it.
(3) Set it to PLAY mode. Then, confirm that the tape between the capstan ② and the No.7 guide ③ is not loosened (0.5mm or less).

If not (more than 0.5mm), turn the height adjusting screw ④ of No.7 guide ③ until the rating is obtained.
(4) Set it to REV mode again. Confirm that the tape loosening between the No.6 guide ① and the capstan ② is 0.3mm or less.

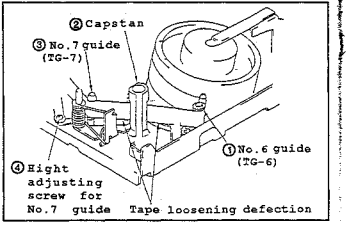


Fig.II-40

4-6 Checks after Adjustments

*Note: If the following ratings cannot be obtained, perform the tracking, tracking fine, No.2 guide and No.7 guide adjustments, respectively.

4-6-1 Tracking Check (Fig.II-41)

(1) Set it to the track shift mode. Confirm that the amplitude of RF envelope is 70% approx.
(2) Confirm that the minimum amplitude (E MIN) is 65% or more of the maximum (E MAX).
(3) Confirm that the waveform has no variations.

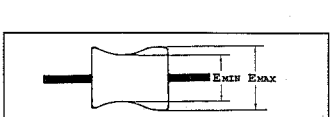


Fig.II-41

4-6-2 CUE/REV Waveform Check (Fig.II-42)

(1) Playback the alignment tape for tracking adjustment. Then, set it to REV mode.
Confirm that the tops between each waveform remains stable and equal within 5 sec.
(2) Set it to CUE mode.
Confirm that the tops between each waveform remains stable and equal for mor than 5 sec.

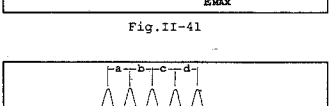


Fig.II-42

4-6-3 Rise Time Check

(1) Playback the alignment tape for tracking adjustment.
(2) After ejecting the tape once, playback it again.
(3) Confirm that the RF envelope rises horizontally within 2 sec. Also, check that the tape is not loosened around the pinch roller.
(4) After set it to CUE/REV and FF/REW, playback it again.
Confirm that the RF envelope rises within 2 sec. horizontally.
Also, check that the tape is not loosened around the pinch roller.
(5) Repeat check procedures from (2) to (4) again.

4-6-4 Tape Movement Check (Fig.II-43)

(1) Playback the cassette tape having 10μmm in thickness (P6-120 etc.).
Confirm that the tape at each guide as indicated in the Fig.II-44 is not deflected or curled. (less than 3mm acceptable).
(2) Set it from PLAY to CUE. Then, set it from PLAY to REV.
Confirm that the tape at each guide is not also deflected or curled. (less than 0.3mm acceptable).

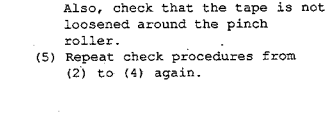


Fig.II-43

Canon

Canovision 8

SERVICE MANUAL

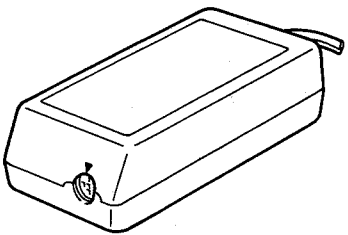
CA-E7E, B, AS

(REF. NO. D14-1130, 1133, 1134)

COMPACT POWER ADAPTOR

PAL

SECAM



DY8-1141-130-000
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Canon Inc.
Video Technical Service Dept.
First Edition: May. 1988
Printed in Japan

SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine CANON replacement parts.
   Especially critcal parts in the power circuit block should not be replaced with other makes.
   Critical parts are marked with ⚠ in the schematic diagrams.
2. The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in the viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, CANON approved one.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been oberheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers; insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

5-1 Leakage Current Cold Check

1) Unplug the AC cord and connect a jumper between the two prongs on the plug.
2) Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metalic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metalic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ. When the exposed metal does not have a return path to the chassis, the reading must be ∝.

5-2 Leakage Current Hot Check

1) Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2) Connect a 1.5KΩ 10 watt resistor, paralleled by 0.15μF capacitor, between each exposed metalic parts on the unit and a good earth ground such as a water pipe, as shown in figure 1.
3) Use an AC voltmeter, with 1000Ω volt or more sensitivity, to measure the potential across the resistor.
4) Check all exposed metallic parts of the cover (Cable connection, Handle bracket, metallic cabinet. Screwheads, Metallic overlays, etc), and measure the voltage at each point.
5) Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6) The potential at any point should not exceed 0.75V RMS.
   A leakage current tester (FLUKE MODEL: 8000A equivalent) may be used to make the hot checks.
   Leakage current must not exceed 0.5 milliamp.
   In case a measurement is out side of the limits specified, there is a possibility of a shock hazard, and corrective action must be taken before returning the instrument to the customer.

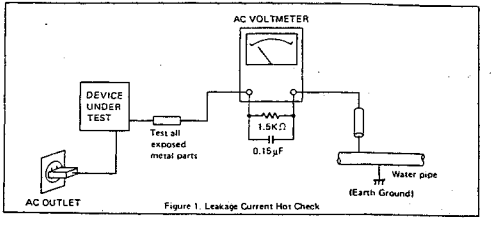


Figure 1. Leakage Current Hot Check

Chapter 1 Operations

1.Main Parts in Mechanical Section

1-1 Locations and Nomenclatures

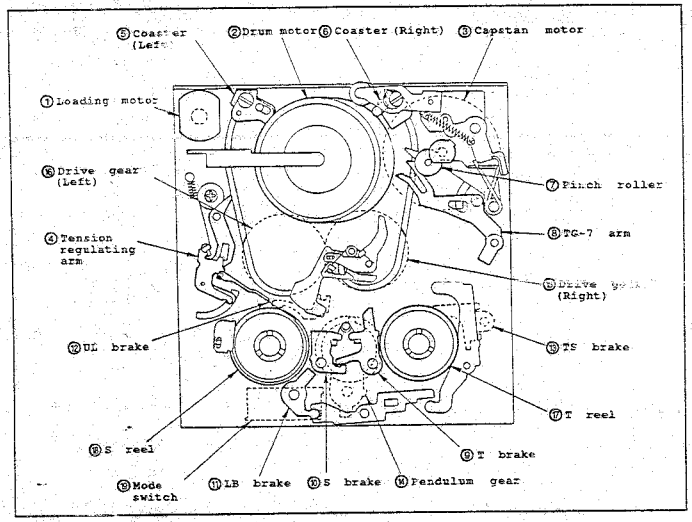


Fig.I-1

1-2 Relationships between Each Mode and Mode Switch

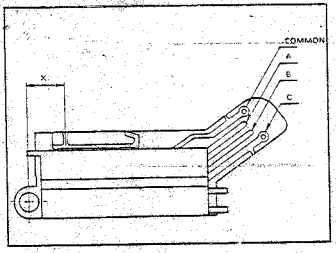


Fig.I-2

Modes	X (mm)	A	B	C
Eject	1.7-2.7	opened	opened	shorted
Blank	2.7-5.7	opened	opened	opened
Load/Unload	5.7-6.7	opened	shorted	shorted
Blank	6.7-8.1	opened	shorted	opened
Stop	8.1-9.1	shorted	shorted	opened
Blank	9.1-12.0	shorted	opened	opened
Play	12.0-13.3	shorted	opened	shorted

Table I-1

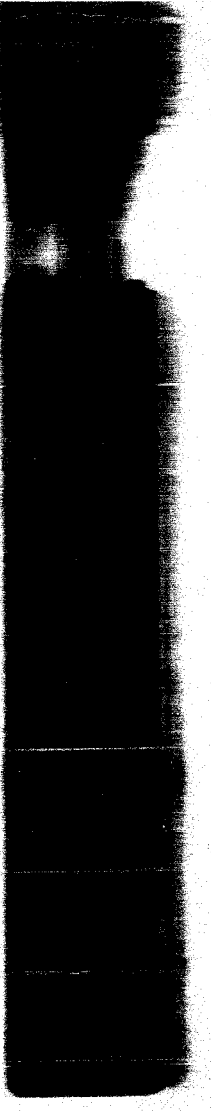
Note: "Opened" and "Shorted" in the table is versus the COMMON.

3. Disasse

3-1 Rol
3-2 Gui
3-3 Capst
3-4 S Brak
3-5 LB Brak
3-6 LB Re
3-7 RK S
3-8 Pinc
3-9 TG-1
3-10 S Re
3-11 Ten
3-12 Dru
3-13 Beam
3-14 Tim
Tim
3-15 Rel
3-16 UL
3-17 Coas
3-18 Coas
3-19 Lost
3-20 Rot
3-21 Ten
3-22 Bac
3-23 T Re

4. Tape Path

4-1 Prep
4-2 Track
4-3 Track
4-4 No.2
4-5 No.7
4-6 Check



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CHAPTER II CIRCUIT OPERATION 2

CHAPTER III ADJUSTMENT 4

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SCHEMATIC DIAGRAM 10

Chapter I General

CA-E7 is a compact and light weight AC power supply for VM-E70, and is developed also as a quick charger for battery pack BP-E77.

1. Features:

1) Applicable to world-wide commercial power source.

2) By separating power supply section and Charge Coupler CR-E7 (connection part), the unit weight of VM-E70 at recording can be reduced.
Charge Coupler CR-E7 can be used at battery charging.

2. Specifications:

1) Input voltage: 100V - 240V AC (±10%)
50/60Hz

2) Output voltage (at 100V AC inputted):

Adapter mode	6.0V DC (constant voltage)
	1.5A DC (max.)
Charge mode	1.1A DC (constant current)
	10.0V DC (max.)

3) Battery pack charging

Charging method:	Constant current quick charging system
Charging current:	1.1A
Charging time:	approx. 80 minutes
Charging complete detection:	Battery voltage drop detection

4) Environmental conditions:

Ambient temperature/humidity for operation	0°C - 40°C 85% RH
Ambient temperature/humidity for storage	-30°C - 70°C 60% RH

5) Dimensions: 130 x 65 x 35(mm)

6) Weight: 350g approx.

Chapter II Circuit Operation

1. Overview

The AC power supplied from a commercial receptacle flows through the primary noise filter circuit and fullwave-rectified and smoothened by D1, L2 and C7, then it becomes the DC power. Then it goes through T1 and becomes pulse current by Q1 which is switched by PWM signal (130 kHz approx.) outputted from pin 2 of IC51. By this pulse current, pulse voltage is generated at the secondary circuit. It is rectified and smoothened by D21, C21, C22, L21 etc., and outputted from the output terminal.
The state of secondary side is fed back to the primary side by PHC1.

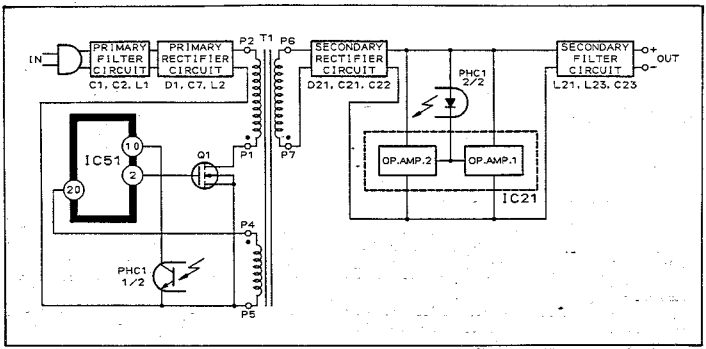


Fig. 1

2. Switching Circuit

When the power is supplied, starting voltage is applied to pin 20 of IC51 via R1-4 (starting resistances). IC51 starts to operate and outputs PWM signal (130kHz approx.) from pin 2. By the PWM signal, Q1 is switched over to control pulse current which flows pins 1 and 2 of T1.

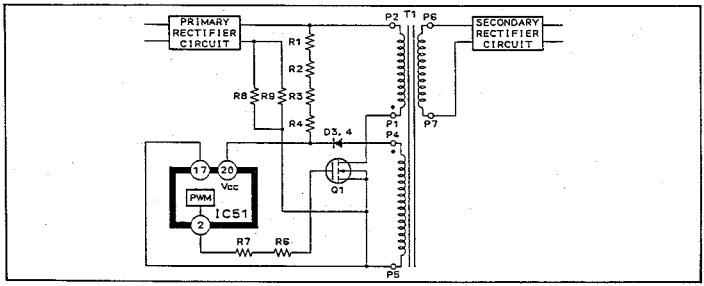


Fig. 2

3. Constant Voltage Circuit (in Adapter mode)

In adapter mode, C terminal goes high to turn off Q31 and 32. Zener voltage at ZD21 is divided by R42 and 44 and it is applied to (+) side of comparator 1 as a reference voltage. On the other hand, the voltage at output terminal (+) is divided by R45, 46 and VR21 and applied to the (-) side via R43 to be compared.

If the output voltage rises, it is regulated in the following manner.

- Output voltage rises (reference voltage for comparator 1) → Output of comparator decreased → Current (emission) of PHC-1 diode increased → Potential at pin 10 of IC51 decreased → High period of output at pin 2 of IC51 shortened → ON period at Q1 shortened → Drop of output voltage to constant level.

When the output voltage drops, it is raised to a constant voltage by reversing the above procedures.

In adapter mode, the comparator 2 regulates the excessive current. Zener voltage at ZD21 is divided by R31 and 32 and it is applied to the (+) side as a reference voltage. On the other hand, to the (-) side, the voltage at R22 and TF21 is applied to be compared. In this manner, the comparator 2 limits the current usually to 1.5A. However, the current which flows instantaneously is limited to 2.5A. (ex.: The rush current at the motor starting)

4. Constant Current Circuit (in charge mode)

CA-E7 regulates the charging current to 1.1A (maximum voltage: 11.0V approx.).

In charge mode, C terminal goes low to turn on Q31 and 32. R33 is connected between the (+) side of comparator 2 and ground via Q31 and then the potential drops. The charging current is converted into voltage by R22 and TF21 and then applied to the (-) side to be compared. On the other hand, to the (+) side of comparator 1, Q32, D32 and R40 are applied in parallel so that the reference voltage at the comparator 1 goes high.

The state of output at secondary circuit is fed to pin 10 of IC51 by PHC-1 as in the same manners in charge mode. IC51 controls the duty ratio at pin 2 keep the output of secondary circuit properly.

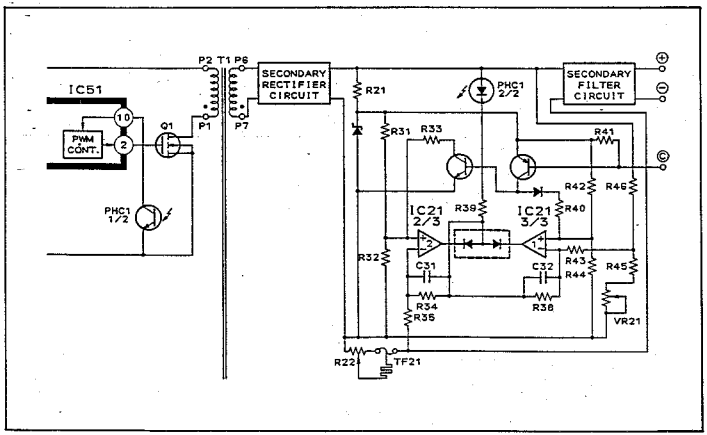


Fig. 3

5. Protection Circuit

When the voltage is applied to the primary circuit excessively, the voltage at pin 8 of IC51 goes high to operate the latch circuit, and then the PWM signal is stopped to be outputted.

To detect the excessive current, the current of primary circuit is converted into voltage by R8 and 9. (This voltage has the negative potential to ground.) It is fed to pin 18 of IC51 for detection.

For example, if the secondary circuit's output terminal is shorted and the excessive current appears, the circuit is protected in the following manners.

- Output terminal of secondary circuit shorted → Voltage at secondary circuit dropped → Emission of PHC1 photodiode stopped → Duty ratio of PWM output at pin 2 of IC51 increased → Current of primary side increased → Potential between R8, 9 and ground increased → Excessive current is detected at pin 18 of IC51 (negative potential) → Latch circuit in IC51 operated → PWM output stopped.

To reset the latch circuit operation, remove the causes (ex. shorting) of failure and emit the charge mainly at C7 fully by unplugging the power supply and leave it for 1 minute approximately.

Also, to protect the circuit from defective parts, F1 and TF21 (temperature fuse) are installed

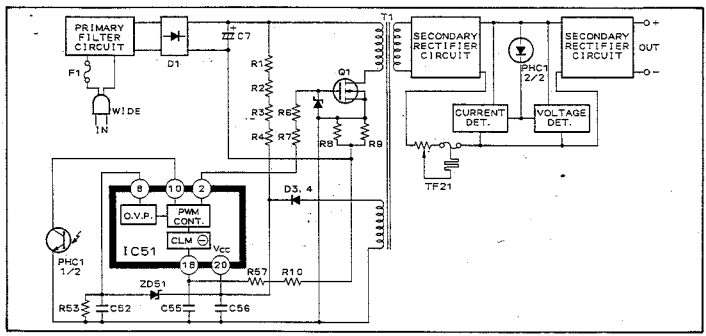


Fig. 4

Chapter Ⅲ Adjustment

1. Output voltage adjustment

M. EQ.	Digital voltmeter
T.P.	Refer to Fig. 5
ADJ.	VR21
SPEC.	6.8 ±0.1V

* Note: Preform the adjustment without charges.

(1) Remove the cover and the external shield case.
(2) Connect (+) and (-) terminals of digital voltmeter to (+) and (-) on C.B.A. respectively.
(3) Adjust the voltage to 6.8 ±0.1V.

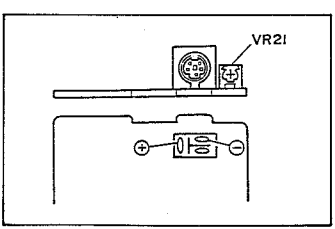
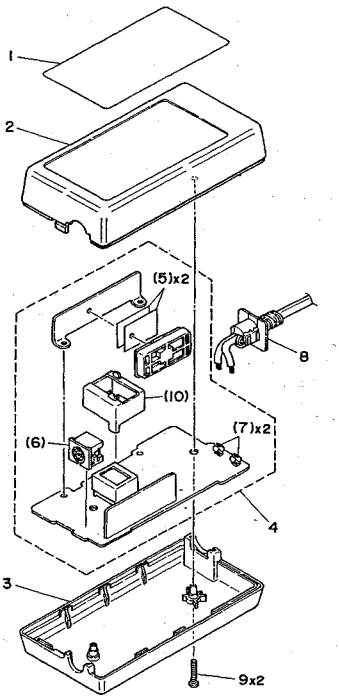


Fig. 5

Exploded Views



MECHANICAL PARTS

	SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
⚠	1	DY2-4299-000 000	D	1	LABEL, CAUTION	VPA880 ONLY
⚠	2	DY2-4286-000 000	D	1	CASE, UPPER	
⚠	3	DY2-4273-000 000	D	1	CASE, BOTTOM	
	4	DY2-4285-000 000	S	1	MAIN C.B.A.	
⚠	5	DY2-4277-000 000	D	2	SHEET, INSULATION	
	6	DY2-4287-000 000	C	1	CONNECTOR 5P	
⚠	7	DY2-4276-000 000	D	2	CLIP, FUSE	
⚠	8	DY2-4288-000 000	D	1	CODE, POWER	CA-E7E ONLY
⚠		DY2-4289-000 000	D	1	CODE, POWER	CA-E7B ONLY
⚠		DY2-4290-000 000	D	1	CODE, POWER	CA-E7AS ONLY
	9	DY2-4275-000 000	F	2	SCREW, CROSS-RECESS	
⚠	10	DY2-4292-000 000	D	1	COVER, TRANSFORMER	

ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
⚠ C1	Y22-2498-000 000	D	1	CAPACITOR, FILM 0.22μF 250V	
⚠ C2	Y22-2284-000 000	D	1	CAPACITOR, FILM 0.047μF 250V	
⚠ C3	Y22-2499-000 000	D	1	CAPACITOR, CERA. 4700pF	
⚠ C4	Y22-2499-000 000	D	1	CAPACITOR, CERA. 4700pF	
⚠ C5	Y22-2500-000 000	D	1	CAPACITOR, CERA. 3300pF	
⚠ C6	Y22-2500-000 000	D	1	CAPACITOR, CERA. 3300pF	
⚠ C7	Y22-1616-000 000	D	1	CAPACITOR, ELECT. 33μF 400V	
⚠ C8	Y22-2313-000 000	D	1	CAPACITOR, FILM 0.047μF 400V	
⚠ C12	Y22-2313-000 000	D	1	CAPACITOR, FILM 0.047μF 400V	
⚠ C13	Y22-1642-000 000	D	1	CAPACITOR, CEAR. 1000pF	
⚠ C14	Y22-2500-000 000	D	1	CAPACITOR, CERA. 3300pF	
⚠ C15	Y22-2500-000 000	D	1	CAPACITOR, CERA. 3300pF	
⚠ C21	Y22-2287-000 000	D	1	CAPACITOR, ELECT. 470μF 25V	
⚠ C22	Y22-2287-000 000	D	1	CAPACITOR, ELECT. 470μF 25V	
⚠ C23	Y22-2308-000 000	D	1	CAPACITOR, ELECT. 470μF 16V	
⚠ D1	Y22-2059-000 000	D	1	DIODE S1WBA60	
⚠ D2	Y22-2291-000 000	D	1	DIODE ERA22-0β	
D3	Y22-2309-000 000	B	1	DIODE ERA15-01	
D4	Y22-2501-000 000	B	1	DIODE ERA22-06	
D5	Y21-1411-000 000	B	1	DIODE MA165	
⚠ D21	Y22-2502-000 000	D	1	DIODE ERC90M02	
D31	Y21-1410-000 000	B	1	DIODE MA151WA	
D32	Y21-1408-000 000	B	1	DIODE MA151A	
⚠ F1	Y22-2503-000 000	D	1	FUSE 1A 250V	
⚠ FT21	Y22-2300-000 000	D	1	FUSE 2A 250V	
IC21	Y22-1132-000 000	B	1	IC AN6562S	
IC51	Y22-2303-000 000	B	1	IC M51977FP	
⚠ L1	Y22-2294-000 000	D	1	FILTER, LINE	
⚠ L2	Y22-2504-000 000	D	1	COIL 25uH	
⚠ L3	Y22-2505-000 000	D	1	COIL 560μH	
⚠ L4	Y22-2506-000 000	D	1	BEAD, FERRATE	
⚠ PHC1	Y22-2507-000 000	D	1	PHOTO COUPLER PC111	
⚠ Q1	Y22-2288-000 000	D	1	FET 2SK903	
Q31	WA2-0505-000 000	B	1	TRANSISTOR UN2211	
Q32	Y22-2304-000 000	B	1	TRANSISTOR UN211E	
⚠ R13	Y22-2510-000 000	D	1	RESISTOR 1MΩ	
⚠ T1	Y22-2508-000 000	D	1	TRANSFORMER	
ZD1	Y22-2289-000 000	B	1	DIODE, ZENER MA4200-M	
ZD21	Y22-2290-000 000	B	1	DIODE, ZENER MA4051-M	
⚠ ZD22	Y21-3655-000 000	D	1	DIODE, ZENER MA4150	
ZD51	Y22-2301-000 000	B	1	DIODE, ZENER MA3330	
ZD52	Y22-2302-000 000	B	1	DIODE, ZENER MA3047	
ZD53	WA1-0520-000 000	B	1	DIODE, ZENER MA3200	

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	DY2-4273-000 000	D	1	CASE, BOTTOM	
	DY2-4275-000 000	F	2	SCREW, CROSS-RECESS	
	DY2-4276-000 000	D	2	CLIP, FUSE	
	DY2-4277-000 000	D	2	SHEET, INSULATION PETP	
	DY2-4285-000 000	S	1	MAIN C.B.A.	
	DY2-4286-000 000	B	1	CASE, UPPER	
	DY2-4287-000 000	C	1	CONNECTOR 5P	
	DY2-4288-000 000	C	1	CODE, POWER	CA-E7E ONLY
	DY2-4289-000 000	C	1	CODE, POWER	CA-E7B ONLY
	DY2-4290-000 000	C	1	CODE, POWER	CA-E7AS ONLY
	DY2-4299-000 000	D	1	LABEL, CAUTION	VPA880 ONLY
	DY2-4292-000 000	D	1	COVER, TRANSFORMER	
	WA1-0520-000 000	B	1	DIODE, ZENER MA3200	
	WA2-0505-000 000	B	1	TRANSISTOR, UN2211	
	Y21-1408-000 000	B	1	DIODE MA151A	
	Y21-1410-000 000	B	1	DIODE MA151WA	
	Y21-1411-000 000	B	1	DIODE MA165	
	Y21-3655-000 000	D	1	DIODE, ZENER MA4150	
	Y22-1132-000 000	B	1	IC AN6562S	
	Y22-1616-000 000	D	1	CAPACITOR, ELECT. 33μF/400V	
	Y22-1642-000 000	D	1	CAPACITOR, CERA. 0.001μF	
	Y22-2059-000 000	D	1	DIODE S1WBA60	
	Y22-2284-000 000	D	1	CAPACITOR, FILM 250V 0.047μF	
	Y22-2287-000 000	D	2	CAPACITOR, ELECT. 25V 470μF	
	Y22-2288-000 000	D	1	FET 2SK903	
	Y22-2289-000 000	B	1	DIODE, ZENER MA4200-M	
	Y22-2290-000 000	B	1	DIODE, ZENER MA4051-M	
	Y22-2291-000 000	D	1	DIODE ERA22-08	
	Y22-2294-000 000	D	1	FILTER, LINE	
	Y22-2300-000 000	D	1	FUSE 2A 250V	
	Y22-2301-000 000	B	1	DIODE, ZENER MA3330	
	Y22-2302-000 000	B	1	DIODE, ZENER MA3047	
	Y22-2303-000 000	B	1	IC M51977FP	
	Y22-2304-000 000	B	1	TRANSISTOR UN211E	
	Y22-2308-000 000	D	1	CAPACITOR, ELECT. 16V 470μF	
	Y22-2309-000 000	B	1	DIODE ERA15-01	
	Y22-2498-000 000	D	1	CAPACITOR, FILM 0.22μF/250V	
	Y22-2499-000 000	D	1	CAPACITOR, CERA. 4700pF	
	Y22-2500-000 000	D	1	CAPACITOR, CERA. 3300pF	
	Y22-2501-000 000	B	1	DIODE ERA22-06	
	Y22-2502-000 000	B	1	DIODE ERC90M02	
	Y22-2503-000 000	D	1	FUSE 250V 1A	
	Y22-2504-000 000	D	1	COIL 25μH	
	Y22-2505-000 000	D	1	COIL 560μH	
	Y22-2506-000 000	D	1	BEAD, FERRATE	
	Y22-2507-000 000	D	1	PHOTO COUPLER PC111	
	Y22-2508-000 000	D	1	TRANSFORMER	
	Y22-2510-000 000	D	1	RESISTOR 1MΩ	
	Y22-2512-000 000	C	1	CAPACITOR, FILM 400V/0.047μF	

2. Equivalent circuits of digital transistor

DTA114EK

DTA144EK

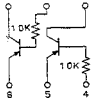
DTC114EK

DTC114TK

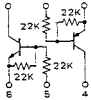
DTC124TK

DTC143EK

DTC144EK



IMB8



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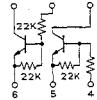

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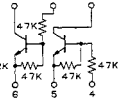

IMH6

3. Indications on circuit diagram

- Resistance is represented in ohms (Ω).
- Capacitance is represented in farads (F).
- Voltages of capacitor are 25 V unless otherwise specified.
- Wattage of resistor is 1/16 W unless otherwise specified.
- Voltages are measured with a digital voltmeter.
- Waveform photographs are taken by using a 10:1 probe.
- IC No. in each C.B.A.s are listed on the bottom of diagrams.
- No. colored in blue are corresponded to the No. of waveform photographs.
- Voltage values indicated in circuit diagram are based on the following condition.

Camera section
Color bar, standard angle of view, AWB-preset

Recorder section
Recording : Color bar (pattern generator)
Playback : Self-recording Playback (Color bar)